REPORT RESUMES

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POSSIBLE EFFECTS OF SELECTED EDUCATIONAL POLICIES AND PROGRAMS ON INCOME SIZE AND DISTRIBUTION IN THE INDUSTRIAL SECTOR OF PERU, PHASE 4--EDUCATION AS AN INSTRUMENT OF NATIONAL POLICY IN SELECTED NEWLY DEVELOPING NATIONS.

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THE ROLE OF EDUCATION WAS EXPLORED WITH RESPECT TO THE DEVELOPMENT OF PERU. SPECIFICALLY, THE PROBLEM WAS TO IDENTIFY EDUCATIONAL PROGRAMS AND POLICIES THAT APPEAR TO BE INSTRUCTIONAL IN ACHIEVING PERUVIAN NATIONAL GOALS. THE ASSUMPTION OF THE STUDY WAS THAT, ALTHOUGH EDUCATION MAY BE A PREREQUISITE FOR ENTRANCE IN AN OCCUPATION, IT IS THE EMPLOYMENT, NOT THE EDUCATION, WHICH GIVES THE INDIVIDUAL HIS INCOME, GROUP DATA WERE GATHERED BY USE OF A QUESTIONNAIRE INTERVIEW WITH A SELECTED SAMPLE OF THE LARGEST EMPLOYERS, TECHNICAL SCHOOL DIRECTORS, AND EDUCATIONAL EXPERTS. IT WAS FOUND THAT ONLY A SMALL PERCENTAGE OF STUDENTS WHO STUDY INDUSTRIAL SUBJECTS ACTUALLY FIND JOBS IN INDUSTRY (10 TO 40 PERCENT, DEPENDING ON THE LEVEL AND TYPE OF EDUCATION). IN ORDER OF IMPORTANCE, THE REASONS DETERMINED WERE ESSENTIALLY THAT (1) THERE ARE NOT ENOUGH POSITIONS AVAILABLE IN EXISTING INDUSTRIAL FIRMS, (2) THE LEVELS AND TYPES OF TRAINING OFFERED BY MOST INSTITUTIONS ARE INAPPROPRIATE FOR EMPLOYMENT, (3) THE ATTITUDES OF BOTH EDUCATORS AND STUDENTS, IN GENERAL, WERE EITHER AMBIVALENT OR UNFAVORABLE TOWARD INDUSTRIAL EMPLOYMENT. RECOMMENDATIONS WERE OFFERED TO RESOLVE THESE PROBLEMS. (HB)

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EDUCATION AS AN INSTRUMENT OF NATIONAL POLICY IN SELECTED NEWLY DEVELOPING NATIONS

Phase 4: Possible Effects of Selected Educational Policies and Programs on Income Size and Distribution in the Industrial Sector of Peru

Cooperative Research Project No. 1032

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FOREWORD

We live in a period of great expectations. The peoples of the newly developing nations have visions of a life potentially free from hunger, disease, ignorance, and serfdom. These awakened peoples, constituting a formerly depressed two-thirds of the human family, are on the march in Africa, in Asia, and in the Americas. They are determined to create viable economic institutions, laws, and mechanisms through which they can assure themselves and their posterity of health, longevity, the material necessities, and even some luxuries. They seek dynamic but dependable political institutions and customs through which justice and freedom may be maintained. They desire social conditions which generate equality of opportunity and create respect for human dignity.

In these heroic efforts to create a better life, the leaders of the nations conceive of education as the tool to shape the new life for their people. To produce more food and fiber, farmers and fishermen must be taught modern practices. To process producer and consumer goods efficiently from the raw resources of field, forest, mine, and sea, labor and management must know modern industrial techniques. To distribute the goods and services, men must learn the economics of marketing and of consuming. Education--both general and technical--has become a major weapon in the struggle of economic growth. Similarly in changing old customs and in developing new political and social institutions and mores, the school plays an increasingly crucial role.

During the past decade the newly developing nations have requested assistance in education planning from the UN agencies FAO, ILO, WHO, UNESCO, and the Technical Assistance Board. More recently the World Bank has made loans for educational projects. On a bilateral nation-to-nation basis, the United States, the USSR, France, Germany, Japan, the Commonwealth Nations, and other technologically developed peoples have been loaning their educational technicians to those nations requesting aid. The largest of such aid programs has been that provided by the United States Agency for International Development. Private corporations, foundations, and other segments of the United States community have made an additional contribution through their non-governmental channels to the gigantic task of creating the educational establishments overseas within which human resources could be developed.

While there is general agreement on the crucial role of education in the developmental processes, there is a critical scarcity of research to discover what educational approaches and strategies may be most effective under differing national and cultural conditions. With assistance from the United States Government, private foundations and corporations, and other sources, the Stanford University School of Education and the Stanford Research Institute have been engaged since 1955 in a variety of research activities to help fill the gap in research-based literature on the subject of educational investment in nation building. Planned, underway, or completed is a series of research projects investigating education as an instrument of national policy in (1) nations emerging from several differing colonial systems, (2) several technologically newly developing nations that have always been politically independent, and (3) several advanced nations that have a long history of independence. From the series of comparative studies an attempt ultimately will be made to extract any generalizations and principles that may lie unobserved or untested at present. From these generalizations and principles there might be constructed strategies that would help both donor and recipient as educational technical assistance is brought to bear on nation building.

The study here reported is one of this series. Under a contract with the Cooperative Research Bureau of the U.S. Office of Education, Mr. Harry Robert White, then a Research Assistant in the Stanford Comparative Education Center, was sent to Peru to study Possible Effects of Selected Educational Policies and Programs on Income Size and Distribution in the Industrial Sector of Peru. Prior to his departure for Lima a faculty advisory committee consisting of Professors H. Thomas James, H. B. McDaniel, Lawrence G. Thomas, and myself as chairman approved Mr. White's research proposal. In Peru Mr. White had the assistance and guidance of several faculty and staff members from Stanford University and Stanford Research Institute, notably Professor Alan B. Coleman and Dr. Eugene Staley. Help was available from many officials and friends in the Ministries of the Peruvian Government, among the leaders of Peruvian industry, from teachers and administrators of schools and colleges, and from students in school and recently graduated. The officials in external aid agencies, particularly UN and its affiliates and USAID, were of great assistance. The warm reception given and the generous contributions of the time of busy people are gratefully acknowledged.

Before departure from Peru for Stanford Mr. White was able to have his first draft of this study reviewed by selected Peruvian and foreign leaders who had been most involved in helping Mr. White collect data. Their appraisals, while not necessarily endorsing all of the findings and recommendations, did encourage the reporting of the research.

Mr. White subsequently was awarded the Stanford University doctorate for his research. The study is available from University Microfilms, Inc., 313 North First Street, Ann Arbor, Michigan, under the title Possible Effects of Selected Educational Policies and Programs on Income Size and Distribution in the Industrial Sector of Peru.

Other studies in this USOE sponsored research are listed on the inside back cover. These five studies, together with others completed, underway, or in the planning stages and funded by other sources are intended to give some of the raw research data out of which hopefully we may draw better guidelines for future educational strategies.

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December 15, 1964

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STATEMENT OF THE PROBLEM

BACKGROUND OF THE PROBLEM. The concern of this study is the role of education in building the Peruvian nation. Therefore, the production of goods and services, the most basic problem of any organized society, must be considered. Later, this broad concern is narrowed to more manageable proportions. This introductory section is merely to present important background information.

Authorities on pre-Spanish Peru describe the Inca regime variously as socialism, communism, or benevolent paternalism.[1] However described, it seems clear that the production and distribution of goods and services in Inca society was highly organized and tightly controlled.[2] Steward and Faron argue that with a limited water supply and primitive technology such discipline was necessary in order to prevent starvation.[3]

Estimates of the aboriginal population of Peru at the time of the Conquest vary, from 3 to 12 million. It is hypothesized that the level of technology being what it was at that time (1532), the population had reached the upper limit ecologically possible. Without an improvement in the technology the population would probably have declined. However, forty years later (1572), when written records were kept (by the Spanish authorities), the native population had declined at least 50% to 1.5 million persons.[4]

This decline seems best accounted for as a result of Spanish seizure of the best agricultural lands, the source of the native population's food supply.[5] It has not been until comparatively recent times that the population of Peru has been restored to the pre-Conquest level.

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[1] Preston E. James, Latin America (3rd ed.; New York: The Odyssey Press, 1959), p. 165; also, Julian H. Steward and Louis C. Faron, Native Peoples of South America (New York: McGraw-Hill Book Co., Inc., 1959), pp. 119-173.

[2] An excellent discussion of Inca society from the anthropological point of view is found in Steward and Faron, especially Chapter 5, "Native Central Andean Culture of the Historic Era," pp. 119-173.

[3] Ibid. The terracing of the Andes is often offered as evidence of Inca attempts to conserve the limited water. Lack of the wheel and writing is offered as evidence of the low level of Inca technology.

[4] Ibid., p. 150.

By replacing one set of rulers and one state religion with another, the Conquest changed very little the structure of the native society. However, some authorities argue that it brought together two incompatible cultural traditions which have never been reconciled.[6] In its economic expression, the Spanish tradition (like that of Western Europe generally) accepts private ownership of property and exploitation of human and natural resources for individual gain. On the other hand, the native economic tradition, growing out of a state completely collectivized and managed by the Inca rulers, provides no basis for the understanding of private ownership of property or private initiative in the production of goods and services (see later discussion of the difficulty of locating entrepreneurs in the contemporary Arequipa area of Peru).

Still predominantly Indian, the present population of Peru (10.5 million) is about 46% pure Indian, 38% mestizo (mixed Indian and European), perhaps 15% pure European, and about 1% Oriental (Japanese and Chinese).[7] Among Peru's three geographical regions, the population is distributed as follows: the Coast, 29%; the Sierra, 58%; the Jungle,

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5. *Ibid*. Other factors in the decline were the civil war which was raging at the time of the Conquest, the introduction of European diseases (particularly smallpox), the use of the natives as laborers in high altitude mines, and the escape of some natives into the jungle area to the east.

6. See James, *op. cit*., p. 165, and Steward and Faron, *op. cit*., pp. 119-173. According to some historians, in 1822 (290 years after the Conquest) independence was "imposed on Peru by outsiders" (Simón Bolívar and José de San Martín). See Hubert Herring, *A History of Latin America* (New York: Alfred A. Knopf, 1961), Chapter 33, "Peru," pp. 537-551. After this imposition, the place of foreign (Spanish) tyrants was simply taken by domestic (Spanish) tyrants. This led to what might be considered Peru's most difficult dilemma: Although an independent nation, many Peruvians feel that real independence has never been achieved.

7. These figures of James, *op. cit*., p. 169, seem as accurate as any. In all such estimates (even Census data) there is great difficulty distinguishing among groups. Many Peruvians (for prestige reasons) prefer to be regarded as pure European (or at least mestizo). The Chinese, imported between 1849 and 1874 as laborers, and the Japanese, arriving after 1900, are among the few distinguishable groups (see Herring, *op. cit*., p. 538). There is disagreement as to the amount of social tolerance which exists. Some authorities say that if an Indian acquires the clothes and behavior of an upper class Peruvian he may pass into the ruling circles. Others claim there is a rigid caste barrier. The author's own observations would favor a position somewhere between these extremes.

13%. The pure Indians represent about 70% of the population of the Sierra and virtually 100% of the population of the Jungle. The other 30% of the population of the Sierra is mestizo. Most of the mestizos and virtually all of the pure Europeans and Orientals live on the Coast. The Peruvians of Swiss, German, and Italian descent are well represented in industry, commerce, and finance.

As mentioned, some authorities feel that Peru represents two incompatible cultural traditions, the Indian and the European. Added to this difficulty is the diversity of European and North American traditions. To some extent this would account for the observed political instability of Peru.[8]

However, the most logical explanation for this instability can be found by examining the production and distribution of goods and services among the Peruvian people (the avenue explored in this study). It was mentioned that at the time of the Conquest the population had probably reached the upper limit ecologically possible using the available technology. In fact, the Andean Indians have been so resistant to the use of new technology that even today the failure of Sierra agriculture to support the population has caused mass migrations to the Coast. Herring tells us that on the Coast some forty families dominate the economy.[9]

Over half of Peru's labor force are engaged in agriculture (see Table 8). Yet Peru must import food to feed its growing population. Most agricultural workers are subsistence farmers in the Sierra. Large, efficient plantations on the Coast export cotton, while rice and wheat must be imported.[10] The nation clearly faces special problems in raising productivity in the agricultural sector. With some 500,000 square miles of land area Peru is about twice the size of the state of Texas. However, less than five per cent of the total land area is under cultivation.[11]

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[8] For example, in the capital city of Lima there are elite private secondary schools for virtually every nationality. While in Peru the author's wife taught in a school catering to U.S. children. The graduates of such institutions tend to attend universities in the sponsoring nation. If Peruvian, the student will return to national life with a cultural background far different from that of others of his fellow countrymen. One wonders if this condition would not account for some of the disputes on the floor of the Peruvian Congress.

[9] Herring, op. cit., pp. 537-551.

[10] Peru's principal exports (expressed in monetary value) are cotton, copper, sugar, lead, and oil (in that order), which are exported mainly to the United States, Great Britain, and Chile. Peru's imports (food and manufactured goods) come mainly from the United States, Germany, and Great Britain (see James, op. cit., p. 160).

Geographically, as mentioned, the nation is divided into three parts by the Andean mountain chain (see Figure 1): a narrow coastal desert which must be irrigated to be productive, the Coast; the mountains themselves which have been heavily farmed for thousands of years and now have limited fertility, the Sierra;[12] and the vast eastern jungle (about half of the nation) which borders on the Amazon region of Brazil, the Jungle.

Land available to increase Peru's small percentage under cultivation is either desert or jungle (the mountains are already overfarmed). The desert needs irrigation and the jungle needs roads of access. Both of these require heavy capital outlays, scarce in Peru. The government has a large number of irrigation and highway projects underway as part of a double-barreled approach: open more land to settlement and increase the productivity of land already settled. However, in spite of the government's efforts to improve the situation, it is predicted that the capacity of agriculture to absorb manpower will continue to decline (see Table 9).

For this reason, non-agricultural employment possibilities are given special consideration in this study. The role of education is viewed as being one of preparing increasingly larger numbers for such employment.

Education in Peru has faced peculiar problems not encountered in the United States.[13] After the Conquest, Peru was left with a large

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[11] In 1959 there were only one million acres of cultivated land in the coastal region. It was estimated that by irrigation it would be possible (at high cost) to increase this by a mere 30% or 40% (see James, op. cit., p. 194).

[12] It should be mentioned that these mountains are some of the most rugged in the world. This fact accounts for the difficulties of transportation and communication among the regions of Peru. Nine of Peru's tablelands and valleys lie above 19,000 feet. Two of the cities visited by the author in this region (Puno and Cuzco) are over two miles above sea level (11,000 and 14,000 feet respectively).

[13] The University of San Marcos, the oldest university in the Western Hemisphere, was founded nearly a century before Harvard University (the respective founding dates are 1551 and 1636). However, the discussion in this section should clarify why the Peruvian educational system has not seemed to make as much progress as that of the United States.

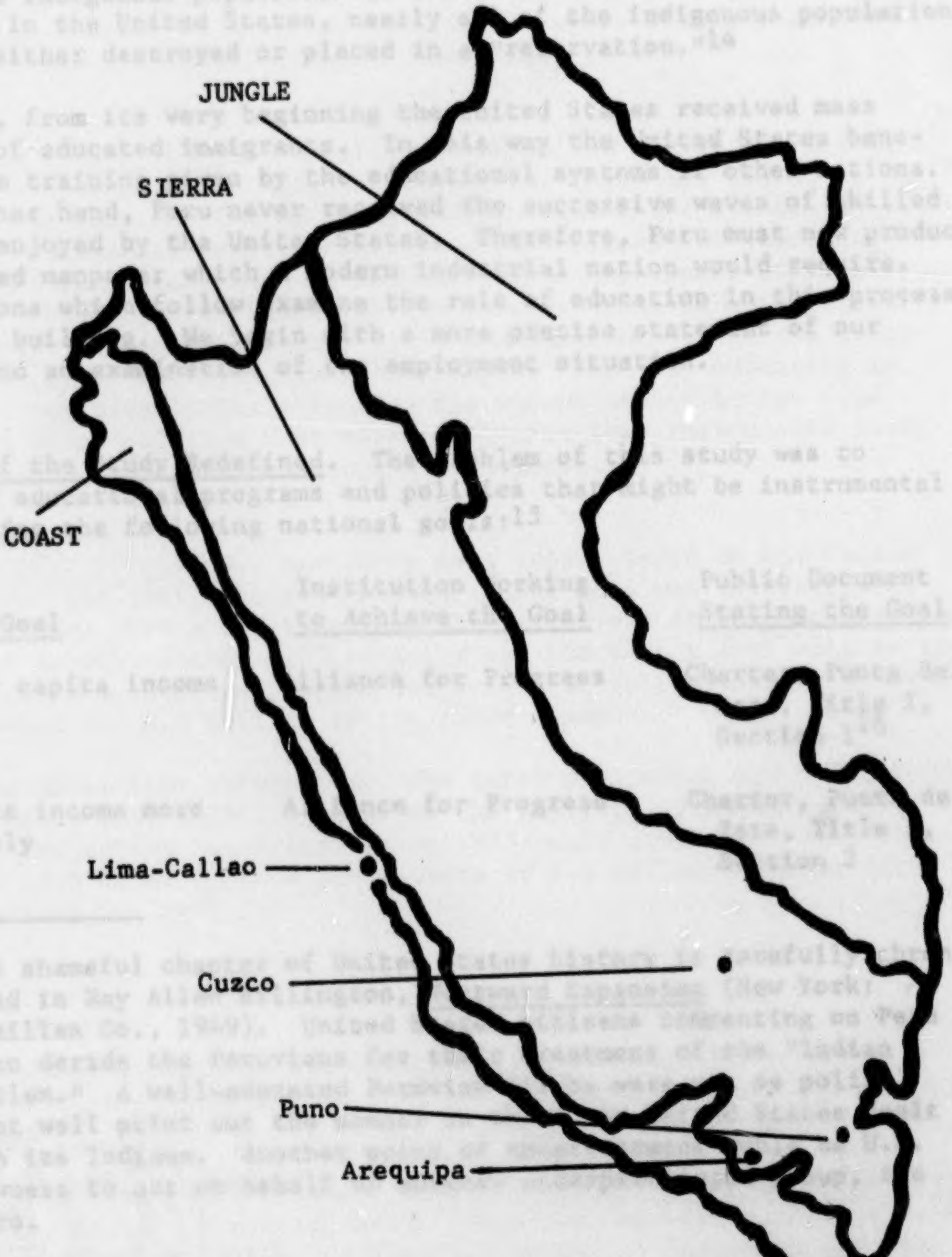
JUNGLE
SIERRA
COAST
Lima-Callao
Cuzco
Puno
Arequipa

FIGURE 1

MAP OF PERU SHOWING MAJOR REGIONS AND CITIES VISITED

Source: Preston E. James, Latin America, p. 170

illiterate indigenous population to educate. After the Westward Expansion in the United States, nearly all of the indigenous population had been either destroyed or placed in a "reservation."[14]

Also, from its very beginning the United States received mass influxes of educated immigrants. In this way the United States benefited from training given by the educational systems of other nations. On the other hand, Peru never received the successive waves of skilled manpower enjoyed by the United States. Therefore, Peru must now produce the skilled manpower which a modern industrial nation would require. The sections which follow examine the role of education in this process of nation building. We begin with a more precise statement of our problem and an examination of the employment situation.

Problem of the Study Redefined. The problem of this study was to determine educational programs and policies that might be instrumental in achieving the following national goals:[15]

Goal	Institution Working to Achieve the Goal	Public Document Stating the Goal
Raise per capita income	Alliance for Progress	Charter, Punta del Este, Title I, Section 1[16]
Distribute income more equitably	Alliance for Progress	Charter, Punta del Este, Title I, Section 2

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[14] This shameful chapter of United States history is carefully chronicled in Ray Allen Billington, Westward Expansion (New York: Macmillan Co., 1949). United States citizens commenting on Peru often deride the Peruvians for their treatment of the "Indian problem." A well-educated Peruvian (if he were not so polite) might well point out the manner in which the United States dealt with its Indians. Another point of embarrassment would be U.S. slowness to act on behalf of another underprivileged group, the Negro.

[15] A more complete list of Peruvian national goals is included as Appendix A. The rationale behind the focus of this study on national goals is presented more fully in Paul R. Hanna (ed.), Education: An Instrument of National Goals, Papers Presented at the 1961 Cubberley Conference Sponsored by the School of Education, Stanford University (New York: McGraw-Hill Book Co., Inc., 1962).

[16] Pan American Union, Alliance for Progress, Official Documents Emanating from the Special Meeting of the Inter-American Economic

Later this problem will be further focused in an attempt to measure the possible effects of selected educational policies and programs on income size and distribution in the industrial sector.

Assumptions of the Study. Research in the United States has revealed a high positive correlation between educational level and income level.[17] This suggests that low income groups might raise their incomes by raising their educational level. However, Thomas points out that most of the national income consists of payments for occupational tasks performed.[18] This suggests that although education may be a prerequisite for entrance into an occupation, it is the employment, not the education, which gives the individual his income. That is, educating an individual may have little effect on his income unless he can find employment which utilizes that education. For this reason this study is concerned with both education and employment.

THE EMPLOYMENT SITUATION. According to a report based on the Census data of 1940 and 1961, the 1964 population of Peru was calculated to be 10.8 million with a labor force of 3.4 million. Assuming a continued population growth rate of 2.9% annually and the same growth rate in the labor force, the total population was projected to the year 1970 (12.8 million total and 4.0 million in the labor force).

Using these same assumptions, the total population and labor force could be projected to 1973 to give us the ten-year planning period 1963-73. Projecting these figures to 1973 would give us a total population of 14.0 million and a labor force of 4.4 million. These data are summarized in Table 1.

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and Social Council at the Ministerial Level Held in Punta del Este, Uruguay, from August 5 to 17, 1961 (Washington, D.C., 1961), p. 10.

[17] See, for example, H. Thomas James, School Revenue Systems in Five States, Report of a Pilot Study (Stanford University, 1961); H. S. Hauthakker, "Education and Income," Review of Economics and Statistics (February, 1959); or Herman P. Miller, "Annual and Lifetime Income in Relation to Education," American Economic Review (December, 1960). However, the reader should be warned that a high positive correlation does not necessarily imply a causal relationship.

[18] Lawrence G. Thomas, The Occupational Structure and Education (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1956), p. 7.

TABLE 1

TOTAL POPULATION OF PERU BY YEAR AND RATE OF INCREASE 1940-1973

Year	Total Population (000)	Annual Increase of Total Population (000)	Labor Force[b] (000)	Annual Increase of Labor Force Per Cent
1940[a]	6,208	1.3	1,958	1.2
1950	7,430	2.4	2,343	2.4
1960	9,633	2.8	3,038	2.9
1961	9,907	2.9	3,125	2.9
1963	10,485	2.9	3,307	2.9
1973	13,966	2.9	4,405	2.9

a. Census year.

b. The labor force was calculated on the basis of the 1961 level (31.54% of the total population).

Source: Servicio del Empleo y Recursos Humanos--SERH (Employment and Human Resources Service), La población, los recursos humanos y el empleo en el Perú (April, 1964), pp. 3, 23, 24.

Using Table 1 we calculate that the increase in the labor force from 1963 (3.3 million) to 1973 (4.4 million) would be 1.1 million. That is, about 110,000 new workers would join the labor force each year due to demographic growth (1.1 million divided by 10 years). This is summarized in Table 2.

Conclusive data on under- and unemployment are not available. In an October 1963 publication the Ministry of Labor estimated that unemployment was between 5 and 10% of the labor force and that underemployment was much higher.[19] This estimate was based on the preliminary results of the 1961 Census in which 4.6% of the labor force did not state an occupation.[20] In a more recent publication, based on further processing of the 1961 Census data, the Employment (and Human Resources) Service states that in the Census year 1.6% of the labor force was unemployed.[21] However, the 1.6% figure does not include unemployed persons seeking work for the first time.

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[19] Ministerio de Trabajo y Asuntos Indígenas (Ministry of Labor and Indian Affairs), Informe sobre la participación del Ministerio de Trabajo en el desarrollo económico y social del Perú, Report given

TABLE 2

DEMOGRAPHIC INCREASE IN THE PERUVIAN LABOR FORCE, 1963-73

Year	Labor Force
1973	4,405,000
1963	3,307,000
Total Increase	1,098,000
Annual Increase	109,800

There are indications that this group (those seeking work for the first time) may be very large in Peru. School leavers, unable to find jobs, have been accumulating over the years.[22] In the section "Mismatching of Industrial Education with the Needs of Industry" it is pointed out that part of the reason for this is the failure of educational institutions to gear their program to employment possibilities.

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at the Second Annual Conference of the Inter-American Economic and Social Council of the Organization of American States (OAS) held at Sao Paulo, Brazil, October 1963 (published in Lima), p. 4.

20. Ibid. As of the time of writing this report the results of the 1961 Census had not been fully released by the Dirección Nacional de Estadistica y Censos.

21. Servicio del Empleo y Recursos Humanos--SERH (Employment and Human Resources Service), La población, los recursos humanos y el empleo en el Perú (April, 1964), p. 49. The Employment Service is a specialized function of the Ministry of Labor and Indian Affairs (Ministerio de Trabajo y Asuntos Indígenas).

22. See section on "Mismatching of Industrial Education with the Needs of Industry" in the following chapter for estimates of the percentage of secondary technical students who find industrial employment.

In fact the very high student discontent in Peru (evidenced by the almost daily accounts of student bus burnings and student-faculty conflicts recorded in leading Lima dailies, El Comercio and La Prensa, 1963-64) seems to be positively correlated with the lack of success of Peruvian educational institutions to find employment for their graduates.

It could be hypothesized that in a list of higher educational institutions student discontent (and/or leftist orientation) would be positively correlated with a low placement rate. In such a list the University of San Marcos (the largest university in the nation and oldest in the Western Hemisphere) would probably rank high in student discontent (and/or leftist orientation) and low in success in placing students (especially the Faculty of Law). On the other hand, the National Engineering University and the Agricultural University at La Molina would rank low in student discontent (and/or leftist orientation) and high, relatively speaking, in student placement. All this is pointed out by way of preparing the reader for the later rejection of the 1.6% unemployment figure.

In a later publication the Ministry of Labor makes an attempt to measure unemployment.[23] This effort is accompanied by a very informative discussion of the findings of the Food and Agricultural Organization (FOA) concerning underemployment. It seems that the FAO has calculated that between 28% and 64% of the agricultural labor force of the Middle East, North Africa, and South Europe (Italy and Spain) is underemployed (excess). In Spain the figure was over 35% in 1950. In Italy the figure was over 29% in 1952 for the whole nation; it varied from 49% in the south to 17% in the north.

Unfortunately the effort of the Ministry of Labor to measure underemployment in Peru was made for only two sectors: commerce (20.9%), and services (29.5%). However, it is sufficient to indicate that in 1963 the Ministry underestimated the number of jobs that would be needed by 1973 to absorb the under- and unemployed (see Table 3).

This estimation would call for a total of 120,650 new jobs each year. Rounding the figures, the Ministry states that any human resources development plan would have to provide 1.3 million new jobs in the next ten years. However, as suggested in the previous discussion, this is based on the assumption that the present level of under- and unemployment (combined) is only 5%.

Writing before the Servicio del Empleo y Recursos Humanos (SERH) figures of Table 1 were available, Vinogradoff felt that a more realistic estimate of under- and unemployment would be more like 10% in each of these categories (20% in total).[24]

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[23] SERH, op. cit., p. 51.

TABLE 3

JOBS NEEDED IN PERU, 1963-73[a]

Reason	Jobs Needed in 10-Year Period	Jobs Needed Annually
Demographic increase	1,007,000[b]	100,700
To absorb the present 5% of the labor force under- or unemployed	222,000[c]	22,200
	1,229,500[d]	122,950
Reduction due to prolongation of education	23,000[e]	2,300
Total	1,206,500	120,650

a. Assuming the 1963 level of unemployment and underemployment to be 5%.

b. The later Census data given in Table 1 would make this figure 1,098,000.

c. Based upon the Census data used by this source this figure would seem to be 170,000 instead of 222,000 (5% of 3.4).

d. The excess 500 is not accounted for in the official figures.

e. The derivation of this figure is not detailed.

Source: Ministerio de Trabajo y Asuntos Indígenas (Ministry of Labor and Indian Affairs), Informe sobre la participación del Ministerio de Trabajo en el desarrollo económico y social del Perú, p. 8.

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[24] E. D. Vinogradoff, "Manpower Reactions," Memo to George Greco, Chief, Manpower Division, United States Agency for International Development in Peru (USAID-Peru), *circa* December, 1963.

The Ministry of Labor's recent estimate of 20.9% and 29.5% underemployment in the commerce and services sectors, respectively, more than supports Vinogradoff's earlier conclusions. Certainly, the later very low finding on unemployment (1.6% of the labor force) is surprising, especially since it was reported in 1963 that 4.6% of the labor force did not state an occupation.

Accepting this new estimate and using more recent Census data (from Table 1), we find that there are 680,000 workers presently under- or unemployed (20% of 3.4 million). To absorb these workers in ten years would require providing 68,000 jobs annually instead of the 22,200 indicated by the Ministry of Labor (see Table 3). This new assumption and these new data call for the revisions of Table 3 and are shown in Table 4.

TABLE 4

JOBS NEEDED IN PERU, 1963-73[a]

Reason	Jobs Needed in 10-Year Period	Jobs Needed Annually
Demographic increase	1,098,000[b]	109,800
To absorb the present 20% of the labor force under- or unemployed	680,000	68,000
	1,778,000	177,800
Reduction due to prolongation of education	23,000	2,300
Total	1,755,000	175,500

a. Assuming the 1963 level of unemployment and underemployment to be 20%.

b. Derived by subtracting the 1963 labor force (3,307,000) from the 1973 labor force (4,405,000).

This revised table would call for 1.8 million new jobs in the ten-year period 1963-73. This compares with 1.3 million called for by the Ministry of Labor for the same ten-year period (using a different assumption about present employment levels and slightly different Census data). Table 4 calls for 175,500 new jobs needed annually in all sectors of the economy.

Urban and Rural Employment. Turning our attention to urban employment alone, we find that not accounting for migration from rural areas some 200,000 new urban jobs are presently needed (allowing 0-2% for "frictional" unemployment) in order to reduce urban under- and unemployment to reasonable levels within ten years.[25] This would call for 20,000 jobs annually for the next ten years to absorb those presently under- and unemployed. Adding 40,000 for demographic growth in the labor force and 60,000 for migration to urban areas, the figure reaches 120,000 jobs required annually in urban areas alone (see Table 5).

TABLE 5

URBAN JOBS NEEDED IN PERU, 1963-73

Reason	Jobs Needed Annually
Due to existing under- and unemployment	20,000
Due to migration to urban areas	60,000
Due to demographic growth in the labor force	40,000
Total	120,000

Source: E. D. Vinogradoff, "Manpower Reactions," Memo to George Greco, Chief, Manpower Division, USAID-Peru, *circa* December, 1963.

Subtracting the 120,000 jobs needed in urban areas alone from the 175,500 jobs (see Table 4) needed in all sectors of the economy, we find that some 55,500 jobs are needed annually in rural areas in the ten-year period 1963-73 (see Table 6).

Since the labor force is about equally divided between rural and urban workers,[26] this residual method of determining the jobs needed in rural areas may seem to yield a somewhat low estimate. However, based on the discussion concerning the decreasing absorptive capacity of agriculture in Peru, it seems realistic.

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[25] *Ibid.*

[26] In 1961 there were 1,554,900 urban workers and 1,569,700 rural workers. See SERH, *op. cit.*, p. 32.

TABLE 6

RURAL JOBS NEEDED IN PERU, 1963-73

Reason	Jobs Needed Annually
Needed in all sectors of the economy	175,500
Needed in urban areas	120,000
Residual for rural areas	55,500

Prospects for Job Expansion. The annual growth rate of Peru's gross national product has been falling in recent years (1960, 12.4%; 1961, 8.3%; 1962, 5.3%). Under the circumstances a 6% growth rate in gross national product during the period 1963-68 seems optimistic. However, the National Planning Institute[27] estimated that a growth rate in gross national product of 6% would create 20,000 new industrial jobs annually for the years 1963-68, the goal set by the United States Agency for International Development (AID).

Optimistically assuming that each new industrial job would create two new jobs in supporting activities to sell, distribute, and maintain the goods,[28] this would yield an additional 40,000 jobs for a total of 60,000 yearly. Accepting 120,000 as the yearly requirement, this leaves a deficit of 60,000 urban jobs annually (see Table 7).

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[27] The National Planning Institute (Instituto Nacional de Planificacion) is responsible to the President of the Republic for over-all national planning. As such it coordinates the planning of the several Ministries (Labor, Education, War, Development, Agriculture, Health, and Commerce).

[28] This 1:2 ratio is used by Dr. Vinogradoff, loc. cit., an expert from the U.S. Department of Labor.

TABLE 7

URBAN JOB DEFICIT IN PERU, 1963-68

Reason	Jobs Predicted	Jobs Needed
Due to demographic growth and migration and to reduce under- and unemployment		120,000
Generated by a 6% growth rate in GNP	20,000	
Secondary jobs generated by the 6% growth rate in GNP	40,000	
Annual Deficit		60,000

Source: E. D. Vinogradoff, "Manpower Reactions," Memo to George Greco, Chief, Manpower Division, USAID-Peru, circa December, 1963.

Absorption Capacity of the Various Economic Sectors. The percentage composition of the labor force engaged in agriculture declined from 62.5 to 57.6 in the period 1950-60 in spite of the fact that Peru must import food to feed its growing population (see Table 8). By 1970 it is predicted to decline even further to 46.2% of the labor force (see Table 9).

Certainly the historical experience of the United States would lead us to expect this. In 1870 some 80% of the U.S. labor force was engaged in agriculture; in 1950 it was 12%; presently it is 10% and declining. Harbison and Myers grouped 85 nations into four levels depending on their stage of development.[29] It was found that the percentage of the labor force engaged in agriculture in the Level IV (advanced) nations was generally less than 25% (with the exception of the USSR which had 50% in 1950; in contrast, the United Kingdom had 5% in the same year). Kuznets found that if nations are ordered by product per capita, the percentage of the labor force engaged in agriculture varies from 61.2 in the low product per capita nations to 14.4 in the high product per capita nations.[30]

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[29] Frederick Harbison and Charles Myers, Education, Manpower and Economic Growth: Strategies of Human Resources Development (New York: McGraw-Hill Book Co., Inc., 1964).

[30] Simon Kuznets, Six Lectures on Economic Growth (Glencoe, Ill.: The Free Press, n.d.), pp. 44-45.

It has been hypothesized that this decline in the percentage of the labor force engaged in agriculture is accompanied by, or due to, an increase in product per worker in the agricultural sector. Certainly this was true in the United States. Unfortunately it does not seem to be true in Peru. While the percentage of the labor force engaged in agriculture was declining from 62.5 to 57.6 in the period 1950 to 1960, the product per worker in the agricultural sector declined 700 soles ($22), from 2,900 soles ($109) to 2,200 soles ($87).[31] (See Table 8.)

TABLE 8

DISTRIBUTION OF THE PERUVIAN LABOR FORCE BY SECTORS AND PRODUCT PER WORKER, 1950 AND 1960

Sector	1950		1960	
	Percentage of Labor Force	Product per Worker Soles (000)	Percentage of Labor Force	Product per Worker Soles (000)
Agriculture	62.5	2.9	57.6	2.2
Mining	1.8	27.7	1.8	42.1
Industry	17.5	4.1	19.0	4.9
Services	3.4	7.9	5.0	6.9
Commerce	4.4	18.3	5.7	16.9
Finance	0.2	36.3	0.4	43.7
Government	3.6	14.9	3.4	20.1
Others	6.6	2.6	7.1	3.2

Source: Organizacion de los Estados Americanos--OEA (Organization of American States--OAS), Integracion economico y social del Peru central (Washington, D.C., 1961), pp. 16-17.

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[31] Throughout this report the May 1964 exchange rate is used (26.7 Peruvian soles to one U.S. dollar).

These poor prospects for the future absorptive capacity of agriculture lead us to look at industry, which according to the source of Table 8 is Peru's second largest employer.[32] Here the prospects are better. The percentage of the labor force engaged in industry not only rose from 17.5 to 19.0 in the period 1950-60, but also the product per worker in that sector rose from 4,100 soles ($154) annually to 4,900 soles ($184), a rise of 800 soles ($30). Already higher than that of agriculture, this rise of 800 soles per worker in industry compares with a decline of 700 soles ($26) in agriculture in the same period.

Although Table 8 shows that several other sectors of the economy have a high product per capita, they employ only a very small percentage of the labor force. Therefore they are not likely to have a very large effect on per capita income or its distribution. This is particularly true of mining and finance.

Highly mechanized, the personnel needs of the mining sector are low and stable (1.8% of the labor force during a ten-year period). Also, under the constant threat of nationalization,[33] this sector is unlikely to seek expansion. The finance sector employs an exceedingly small percentage of the labor force (0.2% in 1950 and 0.4% in 1960). Table 8 summarizes this information.

Table 9 confirms these observations with more recent, if not exactly comparable, data. In this table we see that, in the nine-year period for which data are offered, the agricultural sector declines in its manpower absorption capacity (from 51.4% of the labor force in 1961 to 46.2% in 1970). The fishing sector increases by 0.4% (although the number of workers engaged in fishing is relatively small).

The mining sector remains the same at 2.2%. The manufacturing sector increases by 1.5% (from 13.7 to 15.2). The construction sector increases by 3.3% (from 3.5 to 6.8, the largest single increase. Yet the industrial sector employs far more workers).[34] The electrical sector remains constant at 0.3%, and the commerce, transportation, and services sector remains constant at a high 28.4%.

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[32] This disagrees with Table 9 in which the commerce, transportation, and services sector appears as Peru's second largest employer. Undoubtedly this is due to a difference in classification. In Table 8, commerce and services are listed as separate sectors.

[33] In early 1964 there was a controversy over the possible nationalization of International Petroleum Company (Standard Oil of New Jersey).

[34] We will discuss the Army's industrial training program in the chapter "Solutions to the Problem."

TABLE 9

DISTRIBUTION OF THE PERUVIAN LABOR FORCE BY ECONOMIC SECTOR 1961 AND 1970

Sector	1961 (Census)		1970 (Projected)	
	Number of Workers (000)	Percentage of Labor Force	Number of Workers (000)	Percentage of Labor Force
Agriculture	1,604.9	51.4	1,867.4	46.2
Fishing	16.0	0.5	34.6	0.9
Mining	69.2	2.2	88.8	2.2
Manufacturing	428.2	13.7	614.8	15.2
Construction	109.1	3.5	274.1	6.8
Electricity	9.0	0.3	11.6	0.3
Commerce, transportation, services	888.2	28.4	1,151.7	28.4
Total	3,124.6	99.9	4,043.0	100.0

Source: Servicio del Empleo y Recursos Humanos--SERH (Employment and Human Resources Service), La poblacion, los recursos humanos y el empleo en el Peru (April, 1964), p.58.

Worth mentioning about this last sector is the fact that by combining commerce, transportation, and services into one sector the relative importance of each of these three segments is disguised, although it would appear that the sector itself is relatively important. However, the fact that the absorptive capacity of this sector does not increase in the nine-year period would indicate that it has limited expansion possibilities.

Of interest is the fact that this high percentage of the labor force engaged in commerce, transportation, and services may indicate a highly skewed income distribution (see discussion in section "Income Size and Distribution"). The 28.4% in this sector compares with only

13.7% in manufacturing. This high percentage is probably swollen by the services segment which is composed mostly of domestics. If so, this would indicate that one segment of the population is able to purchase the services of another segment of the population in the form of domestic help, a certain indication of a highly skewed income distribution.

However, in spite of the fact that the industrial (manufacturing) sector offers the best possibilities for job expansion, in a survey of nineteen of Peru's largest such firms, it was found that only one (possibly two) had definite intentions to expand (see Appendix C). Many of the others mentioned that their personnel was highly "stable." In fact some of these firms expressed a desire to lay off personnel.

In view of the estimated deficit of 60,000 urban jobs annually, this could be a serious obstacle to increasing the per capita income and distributing it more equitably. The reasons for this lack of expansion in industry will come under closer scrutiny in the section "The Shortage of Industrial Jobs." As for now, we turn to a closer look at the demand for personnel in Lima-Callao, Peru's largest urban area.

Demand for Personnel in Lima-Callao. According to the assumptions of our study, education cannot have an effect on income unless those who are educated can find employment which uses their training. For this reason we turn to the demand for personnel in the metropolitan area of Lima (which includes the port of Callao). Lima contains about three-fourths of the industrial firms and employs about two-thirds of all the industrial workers in the nation.[35]

For this reason the demand for personnel in Lima-Callao should represent a large part of the national demand. The Employment and Human Resources Service, one of the best such services in Latin America, made an analysis of the requests for personnel which were received in 1962. Received were 73,727 such requests, representing 6,203 vacancies distributed as shown in Table 10.

From this table it can be calculated that 76.1% of the requests for white-collar workers (27.0 plus 49.1) and 78.4% of the requests for blue-collar workers (63.8 plus 14.6) were in two activities: (1) manufacturing, and (2) commerce, banking, insurance, and real estate. However, the fact of greatest interest in this investigation is that there were only 6,203 vacancies listed with the Employment Service during the year. This compares with an annual estimated urban need for 120,000 jobs annually.

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[35] Fernando Romero, Educacion y desarrollo economico, Banco Central de Reserva del Peru, Lima, 1963, p. 194.

TABLE 10

DISTRIBUTION OF REQUESTS RECEIVED BY THE PERUVIAN EMPLOYMENT SERVICE, 1962

Economic Activity	White-Collar (Percentage)	Blue-Collar (Percentage)
Agriculture, jungle farming, hunting, and fishing	0.6	3.4
Mining and quarrying	0.8	1.0
Manufacturing	27.0	63.8
Construction	2.1	7.5
Electricity, gas, water, sanitary services	0.1	0.2
Commerce, banking, insurance, and real estate	49.1	14.6
Transportation, storage, and communications	2.0	4.2
Services	18.3	5.3
Total	100.0	100.0

Source: Servicio del Empleo y Recursos Humanos--SERH (Employment and Human Resources Service), El empleo y los recursos humanos, July-September 1963 (Lima), p. 26.

It is true that the main office of the Employment Service is located in Lima and therefore could not be expected to service outlying regions (although it has plans to expand to other cities). On the other hand it is also true that most of the large employers have offices in Lima and recruit personnel for their outlying operations from the Lima area (see Appendix E). At the same time they often use other means of locating personnel, such as newspapers, which effectively screen out illiterates. However, for the Employment Service to receive only about 5% of the needed requests seems somewhat low, indicating a limited demand for personnel in existing firms (or possibly the failure of employers to make use of the service).[36]

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[36] There is evidence that the United States Employment Service (USES) is also having difficulties in this respect. See Edward T. Chase,

Two other facts about the Employment Service study are important to this investigation. One is that 54.2% of requests for white-collar workers required that the applicant have completed secondary school. This is offered in support of Recommendation 2a, Chart 6, to the effect that school dropouts at the secondary level be reduced. This also applies to the second fact that 90% of employers required that the applicant (both white- and blue-collar) be between the ages of 20 and 40. This is also evidence in support of Recommendation 2b that opportunities be increased for continuing study at the secondary level. This information is summarized in Tables 11 and 12.

TABLE 11

EDUCATIONAL LEVEL REQUIRED OF APPLICANT IN JOB REQUESTS LISTED WITH THE PERUVIAN EMPLOYMENT SERVICE, 1962

Educational Level	White-Collar (Percentage)	Blue-Collar (Percentage)
Primary	3.2	6.4
Secondary	54.2	1.6
College	5.8	0.05
Not indicated	36.8	91.9
Total	100.0	99.95

Source: Servicio del Empleo y Recursos Humanos--SERH (Employment and Human Resources Service), El empleo y los recursos humanos, July-September 1963 (Lima), p. 28.

The main conclusion of interest to us in this investigation is that there seems to be a totally insufficient number of jobs available. For this reason the training of entrepreneurs and the self-employment of craftsmen seem advisable.[37] Measures seem necessary to prevent students from dropping out of school before they are old enough to find suitable employment or legally qualified for self-employment (able to sign contracts). Otherwise, whatever education is received is unlikely to have much of an effect on either income size or distribution.

"The Job-Finding Machine: How to Crank It Up," Harper's Magazine (July, 1964), pp. 31-36.

37. See the discussion of the Graduate School of Business Administration; the Vega Plan to train small industrialists; and Recommendations 1b and 1d, Chart 6 in the chapter "Solutions to the Problem."

TABLE 12

AGE LEVEL REQUIRED OF APPLICANT IN JOB REQUESTS LISTED WITH THE PERUVIAN EMPLOYMENT SERVICE, 1962

Age	White-Collar (Percentage)	Blue-Collar (Percentage)
Less than 20 years	3.5	8.9
Between 20 and 40 years	91.2	88.1
41 years or more	0.8	1.3
Not indicated	4.5	1.7
Total	100.0	100.0

Source: Servicio del Empleo y Recursos Humanos--SERH (Employment and Human Resources Service), El empleo y los recursos humanos, July-September 1963 (Lima), p. 28.

INCOME SIZE AND DISTRIBUTION. There seems to be some uncertainty among those concerned as to whether or not Peru in recent years has been either raising per capita income or distributing income more equitably. For example, the Central Bank of Peru, using the concept of gross national product per capita, offers the figures in Table 13.

TABLE 13

GNP PER CAPITA ACCORDING TO THE CENTRAL RESERVE BANK OF PERU, 1952-59

Year	GNP per Capita (U S. $)	Year	GNP per Capita (U.S. $)
1952	150	1956	168
1953	146	1957	172
1954	137	1958	152
1955	156	1959	143

Source: Banco Central de Reserva del Perú (Central Reserve Bank of Peru), Renta Nacional del Perú, 1961, p. 27, as reported in Bruno Moll, Renta nacional, distribución y desigualdad, Universidad Nacional Mayor de San Marcos, Facultad de Ciencias Económicas y Comerciales, Instituto de Investigaciones Económicas, Lima, 1963.

From these figures, the most authoritative in Peru, it cannot be said with certainty that the per capita income is increasing.[38] As pointed out by Moll,[39] these statistics certainly do not permit a judgment as to whether or not income is being more equitably distributed. It seems that most of the investigators have limited their efforts largely to such concepts as national growth rates and per capita gross national product, neglecting study of the distribution of the product (see Moll's summary of research on this topic).

Such being the case, should the gross national product per capita be increased, it would be difficult to say who would benefit from such "progress." In fact, this confusion leads to debates among the authorities as to whether or not economic progress is actually occurring in Peru. However, in spite of the lack of research on this topic, we shall attempt to use available data to answer some of these questions.

One illustration of the limited type of data which can be used was offered in our previous comments on the high percentage of workers in certain sectors of the economy (domestics in the services sector). In Lima's plush suburbs (San Isidro and Miraflores) it is possible to see long lines of such domestic workers in any privately run employment office any day of the week. An informal survey reveals that the monthly wages of these workers is about $20 ($240 yearly). The point made earlier, which is appropriately repeated here, is that abundant domestic help indicates a poor distribution of wealth. Apparently, one (very small) segment of the population is able to purchase (at a very low price) the services of another (very large) segment.

The difficulty of assembling data on income distribution is illustrated by the steps which were necessary to compile Table 14. This table was based on income data arranged in a far different manner from that found here. First, data on white- and blue-collar workers were found to be in separate tables (which is customary in official Peruvian statistics). Second, wages for white-collar workers were stated in monthly terms (again, customary), whereas those for blue-collar workers were stated in weekly terms (an improvement over the usual reporting in daily terms). Third, and last, income brackets for both white- and blue-collar workers were irregular and tended to widen at the higher incomes, unintentionally making it appear that large numbers of people were receiving high incomes.

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[38] Drs. Hanna and Staley (see Preface) point out that GNP figures generally report only on transactions requiring monetary exchanges in the market place. In dual economies with both a modern sector (based on monetary exchanges) and a non-monetary sector (based on subsistence farming and barter) the possibly considerable value of the goods and services produced in the subsistence sector is not reflected in GNP figures. Therefore, in countries like Peru such figures generally understate the total value of the gross national product. To this degree such figures are misleading.

[39] Bruno Moll, Renta nacional, distribución y desigualdad, Universidad Nacional Mayor de San Marcos, Facultad de Ciencias Económicas y Comerciales, Instituto de Investigaciónes Económicas, Lima, 1963.

These three characteristics of the basic data made it necessary first to convert the blue-collar weekly wages to monthly wages, second to regroup the wage brackets for the two sets of data, and third to combine the two sets of data into one table. While still at an intermediate step, significant information began to emerge. It was found that 24% of the white-collar workers were in the lowest income bracket, whereas 67% of the blue-collar workers were in this bracket, a fact which indicates a significant difference in income level between these two groups (however, a difference which might be expected to exist in some amount in all nations):

	White-Collar		Blue-Collar	
Wage Bracket (Soles)	Number of Workers in Bracket	Percentage of Total Workers	Number of Workers in Bracket	Percentage of Total Workers
- 1,000	77,246	23.91	653,202	67.01

Here both sets of wage data are expressed in monthly terms and included in the same wage bracket. However, white- and blue-collar data are still held separate. The percentage figures shown include 39,000 white-collar workers and 151,000 blue-collar workers (190,000 workers in total) that did not specify a wage bracket in the 1961 Census. In the compilation of Table 14 it seemed reasonable to drop this group (leaving a total of 1.1 million workers instead of the original 1.3 million).

Examining Table 14 we find that 64% of the 1.1 million workers in the sample were in the lowest income bracket (0-1,000 soles, or $37 monthly) and earned 24% of the total wages accruing to the total group. On the other hand, 28% of the total wages accruing to the 1.1 million workers went to the 3% falling in the highest income bracket (10,001 soles and more, or over $375 monthly).

Certainly with all the reworking of data, no claim to accuracy can be made for these figures. This is especially true when it is considered that 15% of the original Census group did not state an income bracket (0.2 million out of 1.3 million). Also, of course, this 1.3 million was only about 42% of the 3.1 million workers in the total labor force in 1961 (see Table 1). Influencing our conclusions also

TABLE 14

MONTHLY WAGES IN PERU BY INCOME BRACKETS, 1961

Wage Bracket (Soles)	Number of Workers in Bracket (000)	Total Wages[a] to Workers (000,000)	Percentage of Total Workers	Percentage of Total Wages
0-1,000	730.4	365.2	63.8	24.1
1,001-2,000[b]	293.1	439.7	25.6	29.0
2,001-3,000[c]	46.3	115.8	4.1	7.6
3,001-4,000	16.6	58.1	1.4	3.8
4,001-5,000	8.6	38.7	0.8	2.5
5,001-6,000	5.0	27.5	0.4	1.8
6,001-7,000	2.5	16.3	0.2	1.1
7,001-8,000	2.2	16.5	0.2	1.1
8,001-9,000	1.0	8.5	0.1	0.6
9,001-10,000	1.4	13.3	0.1	0.9
10,001 and more	38.0	418.0	3.3	27.5
Total	1,145.1	1,517.6	100.0	100.0

a. This column was derived by multiplying the number of workers in the bracket by the mean of the bracket (i.e., 500 for the first bracket). That is, 499 was added to the lower limit in each bracket to get the multiplier. However, in the case of the last bracket, it seemed reasonable, since it is an open-ended bracket, to add 999 to the lower limit.

b. The data on both white- and blue-collar workers are included in this table. The table from which this table was derived (SERH, La poblacion . . ., op. cit., pp. 81-82) did not have a bracket (for blue-collar workers) corresponding to the 1,001-2,000 used here. Therefore, for inclusion in this table, a 1,001-2,050 bracket was used.

c. Due to the fact report in "a" the next bracket (for blue-collar workers) that could be grouped from the original table also did not correspond to ours; it was "2,051 and more." The fact that this bracket was open-ended does not seriously affect the figures since it included only 804 blue-collar workers, or 0.9% of all blue-collar workers.

is the fact that this group of 1.3 million workers probably consists of personnel from Registered industry (generally consisting of larger firms) where accurate payroll accounts are kept. If the other 68% of the labor force had been included, the income distribution described above would probably have been further exaggerated.

Although diminishing in recent years, the growth rate of gross national product for the years 1960 (12.4%), 1961 (8.3%), and 1962 (5.3%) would appear to indicate that economic growth is occurring in Peru (see Table 15). In contrast the demographic growth rate for those years was only 2.9% (see Table 1).

TABLE 15

GROWTH RATE IN GNP IN PERU, 1960-62

Year	Percentage of Annual Increase
1960	12.4
1961	8.3
1962	5.3

Source: E. D. Vinogradoff, "Manpower Reactions," Memo to George Greco, USAID-Peru, *circa* December, 1963.

However, a study conducted by the National Planning Institute indicates that about 60% of the income generated by such increases in gross national product may be going to ownership and management, while only 40% goes to the workers (other than management personnel). Adjusting the monetary figures to real terms, this information is more fully stated in Table 16.

No data were uncovered as to what percentage of the economically active population was represented by owners. One would guess that it would be a very small figure in Peru. However, the Ministry of Labor reports that "managers, administrators, and directive personnel" constitute 1.5% of the labor force.[40]

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40. SERH, *La poblacion . . .*, *op. cit.*, p. 43.

TABLE 16

PERCENTAGE OF INCOME GOING TO WORKERS, OWNERS, AND MANAGERS IN PERU, 1950, 1955, AND 1960

Group Receiving Income	Percentage of Income Received		
	1950	1955	1960
Workers (white- and blue-collar)	38.1	39.3	38.3
Owners and managers	61.9	60.7	61.7
Total	100.0	100.0	100.0

Source: Ministerio de Trabajo y Asuntos Indigenas (Ministry of Labor and Indian Affairs), Informe sobre la participación del Ministerio de Trabajo en el desarrollo económico y social del Perú.

If we assume that the ownership group would be about 0.5% of the labor force, then this means that 2% of the labor force receive about 60% of the total earnings. From Table 14 we concluded that 3% of the labor force receive 28% of the total earnings. However, our previous discussion did not take account of earnings going to ownership.

The conclusions from these data do not appear to contradict Moll's suggestion; namely, that although the gross national product of Peru may be growing larger annually and even its rate of growth may be increasing (which it is not, according to Table 15), the great majority of Peru's population may be becoming relatively (and even absolutely) poorer.[41]

Geographical Distribution of Income. This same inequitable distribution of income can be shown to be true geographically throughout Peru. Of Peru's three main geographical regions (the Coast, the Sierra, and the Jungle), the Coast in 1958 with only 29% of the population received 57% of the national income; the Sierra with 58% of the population received 38%; the Jungle with 13% of the population received 5%. Also, the growth rates of per capita income indicate that this condition is being accelerated in the same direction. In the period 1954-58 the increase in per capita income in the Coast was 35% as distinct from 17% in the Sierra and 10% in the Jungle. This information is summarized in Table 17.

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[41] Moll, loc. cit.

TABLE 17

INCOME DISTRIBUTION AND INCREASE IN PERU BY REGIONS
1954-58

Region	Percentage of Total Population in 1958	Percentage of National Income in 1958	Percentage Increase in Income to Region, 1954-58
Coast	29	57	35
Sierra	58	38	17
Jungle	13	5	10
Total	100	100	

Source: Organización de los Estados Americanos--OEA (Organization of American States--OAS), Integración económico y social del Perú central (Washington, D.C., 1961), p. 17.

Investment in Physical Facilities. From the foregoing data and those in the section "The Employment Situation" at least two conclusions of importance in this investigation seem plausible. One (drawn from "The Employment Situation") is that existing employing institutions seem inadequate to employ all of the persons who presently are, or will be, seeking employment. The other is that income increases generated from employment appear to accrue largely to some groups rather than to others (to ownership and management and to the Coastal region).

It might well be argued that this last observation is as it should be. However, given this tendency in the economic system, there seems good reason why this effect should be counterbalanced, rather than accelerated, by various institutions in the society. Appropriate policies and programs for such institutions will be examined in the final chapter.

As for now we turn to a simplified illustration to suggest the nature of these appropriate policies and programs. Consider, for example, investment in a dam. We might ask: Who benefits when the government invests in a dam? Chart 1 offers a hypothesis to answer this question.

CHART 1

WHO BENEFITS WHEN THE GOVERNMENT INVESTS IN A DAM?

Group	Amount of Benefit	
	High	Low
1. The owners and operators of the contracting firm which builds the dam	X (60% of income generated)[a]	
2. The workers who work for the contracting firm		X (40% of income generated)[a]
3. The large firms which will receive the electricity at reduced rates	X	
4. Local citizens who may or may not be able to afford to install and use the electricity and water		X

[a] These figures, illustrative only, are drawn from the discussion concerning Table 16.

Chart 1 indicates that the contracting firm and the large users of electricity stand to benefit the most. Dr. McDaniel (see Preface) suggests that a distinction should be made between the short- and long-term effects of such an investment. He points out that in the long term the local citizens might receive a larger share of such benefits.

This illustration is not meant to imply that the workers and local citizens benefit so little that such an investment is not worthwhile. As demonstrated by the Tennessee Valley Authority (TVA) in the United States, local citizens may benefit substantially from such an investment. However, it would appear that social conditions must be supportive.

Thus understood, this illustration might be generalized to include many investments in physical facilities. For example, it might include roads, especially those connecting the facilities of large industrial outfits. Also it might include a school which, once built, was never properly equipped or staffed (see "Mismatching of Industrial Education with the Needs of Industry" in the next chapter). Without sufficient equipment and adequate staff the school cannot maximally benefit the students it is supposed to serve. However, by constructing the school, the contractor has typically already realized a large profit.

This illustration is primarily concerned with investment in physical facilities. In later discussions we will be more concerned with investment in human resources. It is necessary here only to call the reader's attention to the fact that, as pointed out earlier in this section, there is often more concern with the growth dimension of income than with the distribution dimension (both on the part of the government and private industry). However, needless to say, unless income can be reasonably well distributed, not only is social discontent a danger but growth itself may be restricted.

This same concern of the government with the growth dimension of income as distinct from the distribution dimension apparently extends also to investment in human resources. For example, within the period in which the research was being conducted for this report, it was proposed in the Peruvian Congress that government money be spent for the improvement of the private secondary schools. The rationale for this seemed to be quite reasonable: The private secondary schools are the best secondary schools in Peru. These schools are providing the nation with some of its best education. Peru wants good education. Why not give public money to these worthy institutions?

Overlooked in this proposal is the fact that this would be a direct subsidy to the wealthy. Somewhat less obvious is the fact that gratuitous education at the university level has somewhat the same effect. Here the rationale seems to be a democratic one (a person should not be prevented from receiving a university education for financial reasons alone). However, in practice, because of stiff academic competition for university entrance, those students who attend the better (private) secondary schools have a distinct advantage. The result is a subsidy to the wealthy.

A major reason for the government's concern with economic growth appears to be simply that the large businessmen of any nation are always politically influential (certainly no less so in Peru). On the other hand, other groups such as consumers, local citizens, and the "public" rarely have effective spokesmen. Efforts to persuade businessmen that it is in their long-term interest to distribute income more equitably (and thus create a mass market for their goods) are not always effective. Certainly a businessman cannot act for his best interest in 1974 if he goes bankrupt in 1964. However, Dr. Staley (see Preface) points out that, although it may be a tendency, businessmen are not irrevocably devoted to a short-term policy. Drawing from U.S. experience, Henry Ford paid high wages (relatively speaking) when wages were low.

However, because of the tendency of business to take a short-term approach to economic planning, and the tendency of government to resort to temporary political expedients, experiments should be made with autonomous institutions receiving support from both the government and the business community. Such institutions, because of their broad support and responsibility, might well be able to take a long-term view (to the benefit of all).[42]

THE INDUSTRIAL SECTOR. There is evidence of positive correlation between the Peruvian educational structure and the occupational structure in the industrial sector. The evidence can be indicated by first describing each of the two structures and then pointing out the similarities. We start with the educational structure.

Of a total school enrollment of 1.6 million students in 1962, over 48,000 (3%) were at the university and normal school level, approximately 198,000 (12.6%) at the secondary level, and about 1,352,000 (85%) at the primary level. Table 18 summarizes this.

TABLE 18

STRUCTURE OF EDUCATIONAL ENROLLMENT IN PERU, 1962

Level	Enrollment	Percentage of Total
University and normal	48,140[a]	3.1
Secondary	197,891	12.6
Primary	1,351,714	85.0
Total	1,565,745	100.7

a. Since the universities are autonomous from the Ministry of Education, university enrollments are not given in the source (below). Here an estimate by the author of 40,000 is made for this level.

Source: Ministerio de Educación Pública (Ministry of Public Education), Informe sobre el desarrollo de la educación en el Perú durante el año 1962 (Lima, 1963), p. 5.

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[42] See discussion of the Army's industrial training program, the

In 1962 the Employment Service studied a sample of 604 industrial firms in the Lima-Callao area. Including a sample of 58,718 workers (45% of all workers in Peru employed in firms of 20 or more workers), it was found that there were 1,396 engineers and technicians (2.3% of the total), 10,497 administrators and office workers (18%), and 46,825 unskilled, semi-skilled, and skilled workers (79.9%). This is summarized in Table 19.

TABLE 19

OCCUPATIONAL STRUCTURE OF PERUVIAN INDUSTRY, 1962

Category	Number	Percentage of Total
Engineers and technicians	1,396	2.3
Administrators and office workers	10,497	17.8
Skilled, semi-skilled, and unskilled workers	46,825	79.9
Total	58,718	100.0

Source: Fernando Romero, La industrial manufacturera y su mano de obra en 1962 (Lima, 1963), p. 137.

We note that the low percentage of engineers and technicians in the industrial labor force (2.3) corresponds with the low percentage of students at the university and normal school level (3.1) found in the national educational enrollment structure. The percentage of administrators and office workers (17.8) corresponds roughly with the percentage of students found at the secondary level (12.6). Likewise, the high percentage of unskilled, semi-skilled, and skilled workers (79.9) corresponds to the high percentage of students found at the primary level (85). This is summarized in Table 2[illegible].

National Apprenticeship and Industrial Labor Service (SENATI), the School of Technology, the Graduate School of Business Administration (ESAN), the Vega Plan, and Recommendation 6, Chart 6, in the chapter "Solutions to the Problem."

TABLE 20

CORRELATION BETWEEN THE PERUVIAN EDUCATIONAL ENROLLMENT STRUCTURE AND THE OCCUPATIONAL STRUCTURE OF INDUSTRY, 1962

Educational Structure		Occupational Structure	
Level	Percentage of Enrollment	Category	Percentage of Labor Force
University and normal	3.1	Engineers and technicians	2.3
Secondary	12.6	Administrators and office workers	17.8
Primary	85.0	Skilled, semi-skilled, and unskilled workers	79.9
Total	100.7	Total	100.0

In addition to a positive correlation between educational level and occupation level, there is probably a similar correlation between educational level and income level. For example, the Employment Service reports that for 1962 the offered yearly salary for white-collar workers fell in the interval S/. 9,612 to 12,000 ($360 to 449). S/. is the abbreviation for the Peruvian sol. The offered salary for blue-collar workers fell in the interval S/. 7,212 to 10,800 ($270 to 404). We have already shown that 24% of white-collar workers fell in the lowest income bracket (0-1,000 soles monthly) whereas 67% of the blue-collar workers fell within this bracket (see discussion preceding Table 14).[43] All this suggests that equitable income distribution among employed personnel may depend upon the possibility for workers to change categories (occupational mobility, see Recommendation 4, Chart 6).

Unfortunately, there seems to be a tendency within private firms to give most of the training, travel, and advancement opportunities to persons already at the top, or near the top, of the intra-firm occupational structure. In the short term, for the individual firm, this probably makes good economic sense. It is less risky to train people who have already proven that they can benefit from training. Besides, the individual firm is not so much interested in income distribution as in its increase, and it may be true that one highly trained engineer is more productive than two partially trained mechanics. It is for this reason that governments and other disinterested bodies which can afford to take a long-term view, should attempt to counterbalance this tendency by assisting the less well trained members of the labor force to increase their competence.

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[43] These figures are derived from SERH, El empleo y los recursos humanos, July-September, 1963 (Lima), p. 27.

How this type of upward mobility might redistribute income, as well as increase it, can be illustrated using the occupational structure of Peruvian industry. In advanced stages of economic development it is recommended that 15% of the industrial labor force be engineers and technicians, 18% administrators and office workers, and 67% unskilled, semi-skilled, and skilled workers.[44] Compared in Table 21 with the actual occupational structure of Peruvian industry, some discrepancies can be noted.

TABLE 21

ACTUAL AND RECOMMENDED DISTRIBUTION OF WORKERS IN THE PERUVIAN INDUSTRIAL LABOR FORCE, 1962

Category	Actual Percentage of Total	Percentage Recommended
Engineers and technicians	2.3	15
Administrators and office workers	17.8	18
Unskilled, semi-skilled and skilled workers	79.9	67
Total	100.0	100

Source: Table 18 and Fernando Romero, La industrial manufacturera y su mano de obra en 1962 (Lima, 1963), p. 137.

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[44] Fernando Romero, La industrial manufacturera y su mano de obra en 1962 (Lima, 1963), p. 88.

From this table it can be figured that there is a difference of 12.7 percentage points between the number of engineers and technicians recommended (15%) and that found in the sample (2.3%). The percentage of office workers is about equal to that recommended (18%). There is an overage of 12.9 percentage points in unskilled, semi-skilled, and skilled workers (79.9 as compared to the recommended 67).

This suggests some changes in the occupational structure which would place many workers in higher-paying positions. According to our assumptions, this would raise the per capita income of all industrial employees and distribute income more equitably among them. To simplify our illustration we will consider the first two categories (engineers and technicians, administrators and office workers) as white-collar workers and the last category (unskilled, semi-skilled, and skilled workers) as blue-collar workers. The Employment Service reports the mean monthly wage for white-collar workers during the period July-September 1961 as S/. 3,233 ($120) and the mean monthly wage for blue-collar workers as S/. 1,518 ($60). With these data we can construct Table 22.

TABLE 22

INCOME SIZE AND DISTRIBUTION IN PERU ACCEPTING THE ACTUAL PERCENTAGES OF WORKERS IN THE INDUSTRIAL LABOR FORCE, 1962

Category	Number	Percentage of Total	Monthly Wage	Total Monthly Wages to Category
Engineers and technicians	1,396	2.3	$120	$ 167,520
Administrators and office workers	10,497	17.8	120	1,259,640
Unskilled, semi-skilled, and skilled workers	46,825	79.9	60	2,809,500
Total	58,718	100.0		$4,236,660

Source: Derived from Table 19 and Servicio del Empleo y Recursos Humanos (Employment and Human Resources Service), SERH, Bulletin No. 1 (June, 1963), unpaginated.

From Table 22 we can see that the total monthly income to all categories is about $4.2 million. This would be about $50 million annually or a per capita income of about $830. As an index to the distribution of this income we note that 46,825 workers (79.9%) are receiving only $720 a year ($60 a month times 12 months). On the other hand, if we take the percentages recommended, Table 23 results.

TABLE 23

INCOME SIZE AND DISTRIBUTION IN PERU ACCEPTING THE RECOMMENDED PERCENTAGES OF INDUSTRIAL WORKERS

Category	Number	Percentage of Total	Monthly Wage	Total Monthly Wages to Category
Engineers and technicians	8,808	15	$120	$1,056,960
Administrators and office workers	10,569	18	120	1,268,280
Unskilled, semi-skilled, and skilled workers	39,341	67	60	2,360,460
Total	58,718	100		$4,685,700

From Table 23 we can see that the total monthly income to all categories is about $4.7 million or $0.5 million more than in the previous illustration. This would be about $56 million annually or a per capita income of about $966, which is $136 more than in the previous illustration. As an index of the distribution of this income we note that only 39,341 workers (67%) are receiving this low amount in the previous illustration.

It might be objected that with larger numbers of workers available in higher occupational categories the law of supply and demand would operate (in our second illustration) to reduce wages in the higher categories. This may be true depending on the elasticity of demand for personnel in those categories. If unlimited supplies of high level manpower could be profitably employed in these levels, then wages would not decrease. Certainly, in the case of Peru, there is little danger of oversupplying these categories in the immediate future. To offset this objection is the probability that, with the general upgrading of the labor force represented by second illustration, the entire wage scale would be raised; that is, instead of $120 monthly, white-collar workers would then get, say, $200 monthly, and instead of $60 monthly blue-collar workers would then get, say, $100 monthly.

Analyzed in this way, it seems important to the achievement of the two national goals under consideration (achieving both an increase and a better distribution of income) for Peru to increase the percentage of higher level manpower in the industrial labor force. Therefore, we turn to Peru's facilities for training personnel for industrial development.

The United Nations Economic Commission for Latin America (ECLA) estimated that Peru would need 744 engineers and 1,488 technicians in the period 1956-62. The universities graduated 783 engineers in this period, as shown in Table 24. The state secondary technical schools graduated 2,359 technicians in the two-year period 1961-62 alone, as shown in Table 25.

TABLE 24

ENGINEERS GRADUATED FROM THE UNIVERSITIES OF PERU 1956-62

Field and University	Total	1962	1961	1960	1959	1958	1957	1956
National Engineering University (Lima)								
Mechanical-electrical	451	107	103	79	50	51	32	29
Industrial	80	24	16	16	11	3	7	3
University of San Marcos (Lima)								
Chemical	133	16	17	15	17	18	19	31
University of Cuzco								
Chemical	45	10	8	6	6	4	8	3
University of Trujillo								
Chemical	74	16	19	8	5	10	10	6
Total	783	173	163	124	89	86	76	72

Source: Fernando Romero, La industrial manufacturera y su mano de obra en 1962 (Lima, 1963), p. 95.

TABLE 25

GRADUATES OF THE PUBLIC SECONDARY TECHNICAL SCHOOLS IN PERU, 1961-62

Specialty	Total	1962	1961
Carpentry	389	202	187
Graphic arts	21	14	7
Printing	3	3	-
Leather work	4	2	2
Foundry	30	3	27
Metal shop	14	14	-
General mechanics	841	455	386
Electricity	378	190	188
Electronics	7	7	-
Radio	168	102	66
Television	26	26	-
Power	12	26	-
Automobiles	466	217	249
Total	2,359	1,247	1,112

Source: Fernando Romero, La industrial manufacturera y su mano de obra en 1962 (Lima, 1963), p. 97.

However, of the 744 engineers graduated during the period 1956-62, only 140 entered industry. Likewise, of the 2,359 technicians prepared during the 1961-62 period, only 280 entered industry. These data are summarized in Table 26. This information would seem to yield a conclusive answer as to whether or not a sufficiently large number of technical personnel were trained in this period (1956-62). However, in terms of our assumptions about the correspondence between the educational structure and the occupational structure, it raises an important question:

Why weren't these trained technical workers absorbed by industry?

To answer this question a questionnaire and attitude scale (Appendices E, F, and G) were devised and administered by interview to selected appropriate groups, as follows: (1) the largest employers, (2) technical school directors, and (3) educational experts.

The first group included nineteen of the largest employers, employing one-third of the workers engaged in manufacturing firms registered with the Ministry of Development or one-eighth of the workers engaged in all the manufacturing firms of the nation (see Appendix C).

The second group included all of the directors of the technical schools for men in the Lima-Callao area or one-fourth of all such directors in the nation (see Appendix B). The third groups included fourteen educational experts drawn from nine major national and international institutions concerned with education in Peru (see Appendix D).

TABLE 26

ENGINEERS AND TECHNICIANS GRADUATED AND ENTERING INDUSTRY IN PERU, 1956-62

	ECLA's Recommendation	Graduated from School	Entered Industry
Engineers	744	783	140
Technicians	1,488	2,359[a]	280

a. For 1961-62; Romero states that relevant figures were available only for this period.

Source: Fernando Romero, La industrial manufacturera y su mano de obra en 1962 (Lima, 1963), p. 94.

The administration of this questionnaire and attitude scale involved a tour of the industrial plants and technical education facilities in the Lima-Callao area and a trip to Arequipa, Puno, and Cuzco, outlying cities. The questions raised by this investigation required intensive study of the designs of four educational programs (to be discussed in the final chapter).

Basically, it was found that the reasons why these trained technical workers were not absorbed by industry could be considered under three headings: (1) the shortage of industrial jobs, (2) mismatching of industrial education with the needs of industry, and (3) unfavorable attitudes toward industrial employment.

We turn to an examination of each of these topics in turn.

CAUSES OF THE PROBLEM

THE SHORTAGE OF INDUSTRIAL JOBS--Possibilities for Establishing New Firms. It was estimated that 120,000 urban jobs are needed annually to reduce the present level of unemployment and underemployment to the 2% "frictional" level in the ten-year period 1963-73. If we assume that one-third of these jobs should be in industrial employment and two-thirds in supporting activities, this would call for 40,000 new industrial jobs per year. The National Planning Institute figured that at a 6% growth rate some 20,000 such jobs would be created. This leaves a deficit of 20,000 industrial jobs annually. Table 27 shows the present structure of registered manufacturing industry in 1962.[1]

TABLE 27

STRUCTURE OF REGISTERED MANUFACTURING INDUSTRY IN PERU, 1962

Size of Firm	Firms		Personnel		
	Number	Percentage	Number	Percentage	Mean Number of Persons per Firm
Less than 5 workers	1,037	25	2,936	2	3
From 5 to 20 workers	1,842	44	20,077	13	11
More than 20 workers	1,272	31	128,634	85	101
Total	4,151	100	151,674	100	37

Source: Fernando Romero, *Educación y desarrollo económico*, Banco Central de Reserva del Perú, Lima, 1963, p. 87.

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[1] These firms are registered with the Ministry of Development and Public Works. This would include almost all of the firms of twenty or more workers. However, since 0.4 million workers are engaged in the manufacturing sector (Table 9) and Table 27 accounts for only 0.2 million, conclusions drawn about the total manufacturing sector from these data on registered firms are uncertain.

From Table 27 it can be seen that there were 4,151 firms in 1962 employing 151,674 workers. Only 1,272 (31%) of these had twenty or more workers. Yet they employed 85% of the personnel involved. If it is true that the present estimated 6% growth rate in gross national product would create 20,000 new industrial jobs, this would imply a 13% growth rate in the industrial labor force. Therefore, the required growth rate should be closer to 26% in order to create 40,000 new industrial jobs.

Unfortunately, a survey of nineteen of the largest employers in Peru revealed that only one (possibly two) had definite plans to expand their work force in the immediate future (see Appendix C). As will be seen in a subsequent discussion of labor legislation, there are special reasons why large firms may experience difficulty in expanding.[2] Therefore, the task of creating these 40,000 new industrial jobs annually can be accomplished only through expanding existing firms and creating new, small and medium-sized firms.

The U.S. Agency for International Development (AID) has contracted with the Stanford Research Institute (SRI) to promote industrial development in Peru. The SRI team has a Lima office and one or more experts working with local development authorities in Arequipa, Puno, and Cuzco, principal cities of southern Peru. A tour of these cities and discussion with these experts and local industrialists and educators revealed several facts.

Confirming the figures mentioned earlier, it was found that local technical schools were producing sufficient numbers of graduates. However, only a very small percentage (possibly 10%, which agrees with Romero's estimate), were finding local work in Puno and Cuzco. Arequipa, Peru's second largest city, was able to provide more employment than the other two cities but, again, not a sufficient number of jobs. Many of the graduates were joining the large migrational flow into Peru's major urban areas (Lima-Callao and, to a lesser extent, Arequipa itself). There were simply not enough industrial establishments in those cities to employ all the jobseekers.

Strangely enough, there seemed to be no lack of business opportunities. It was found that a large number of small and medium-sized industries were feasible for Arequipa, situated in one of the most productive agricultural areas of the nation (see Table 28).

Assuming that each job in these industries would generate two additional jobs in supporting activities to sell, distribute, and maintain the goods produced, these 3,145 jobs would create an additional

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[2] Wilson Harwood, Chief of a Stanford Research Institute team in Peru, points out that these large firms may be overcoming some of these difficulties by starting smaller firms.

6,290 jobs or a total of 9,435 new jobs in Arequipa. This would be about 16% of the 60,000 industrial jobs deficit for 1964, or 1.6% of the 600,000 industrial jobs deficit for the ten-year period 1963-73.

TABLE 28

SMALL- AND MEDIUM-SIZED INDUSTRIES FEASIBLE FOR AREQUIPA, PERU, 1964

Firm	Number of Workers
Several food dehydration plants	2,000
Slaughterhouse	300
Cement plant	300
Bicycle assembly plant	70
Fruit and vegetable cannery	60
Hot-process foundry	60
Cold-process agricultural tool factory	30
Truck, bus, and agricultural wagon body factory	25
Copper wire manufacturer	25
Construction hardware factory	25
Metal agricultural or industrial storage bin manufacturer	25
Sulfuric acid plant (for mining operations)	25
Calcium carbide plant (for welding operations	25
Fertilizer mixing plant	25
Insecticide, fungicide plant	25
Paint mixing plant	25
Dry ice food storage plant	20
Small electric motor manufacturer	20
Sanitary earthenware producer	20
Plastic items manufacturer	20
Spectacle frames manufacturer	20
Cement blocks producer	20
Kerosene cooking-stove manufacturer	20
Metal pots and pans manufacturer	20
Total	3,145

Source: Konrad Schultz, Stanford Research Institute Resident Advisor in Arequipa.

The possibilities for industrial development are not as promising in Puno and Cuzco as in Arequipa. However, in view of the large (Indian) population density of these areas, job creation is more important. Certainly, due to the limited purchasing power of the Sierra (see Table 17), large industries do not seem advisable. In the Puno area some of the most promising possibilities seem to be fishing and canning salmon caught in Lake Titicaca, development of a market for local handicraft products, and manufacture of a small hand pump for irrigation.[3]

The Cuzco area offers a larger market than that of Puno. Here small textile mills to use the very fine local llama and alpaca wool seem feasible.[4] In both of these areas it would seem that in view of the limited purchasing power of the population, stress should be put on the mass production of low-cost items (clothes, in view of the often severely cold weather, and food products, in view of the low nutritional levels).

These proposals are recommended in Arequipa, Puno, and Cuzco on the basis of products which these cities import at high costs and which could easily be manufactured at lower costs using local materials and labor. Asked why local industrialists do not establish such enterprises, the SRI men agree: There seems to be a shortage of able and willing entrepreneurs (see discussion of the economic orientation of the Indian in the first chapter). With the establishment of the Alliance for Progress, funds otherwise unavailable have become available. The problem is not so much one of capital shortage as a shortage of good risks to whom to lend the money.[5]

It should be pointed out before continuing with our study that even if all of the recommended firms were established, the needed number of jobs would still not be created. This is pointed out here to prepare the reader for some of the rather unconventional solutions examined later and to introduce our study of the problems involved in expanding firms already established.

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[3] Ascertained by interview with Russel Scarato, SRI Resident Advisor in Puno.

[4] Interviews with Charles Jackson, SRI Resident Advisor in Cuzco, were marred by a partial closing of the city due to Communist demonstrations. Hence, the information on Cuzco is limited.

[5] See discussion in the final chapter of ESAN and the Vega Plan which are both attempts to remedy this situation.

Possibilities of Expanding Old Firms. At this point some review of our argument thus far may assist the reader. Earlier it was pointed out that there is a high demand from labor for jobs and a limited demand from industry for personnel. In several tables (4, 5, and 7) it was shown that much of this demand for jobs is the result of demographic growth in the labor force. In these same tables it was shown that many of the jobs estimated as needed are for the purpose of reducing present levels of unemployment and underemployment.

In the first section of this chapter we attempted to point out that the limited number of industrial jobs is partly due to difficulties in finding willing and able entrepreneurs to establish new firms. In this second section of this chapter we attempt to point out that the limited number of industrial jobs is also partly due to the difficulty of expanding already established firms. In a later section we will discuss still another influential factor in industrial expansion, unfavorable attitudes on the part of both students and educators toward industrial employment. As for now, we turn to the effect of labor legislation on large-firm expansion.

Labor Legislation and Large-Firm Expansion. It is pointed out in the Little report that the high fixed costs of fringe benefits limit the expansion possibilities of private industrial firms.[6] Table 29 shows the costs involved. From Table 29 it can be seen that 50.6% of the base pay of white-collar workers and 60.4% of that of blue-collar workers, goes to the worker as fringe benefits.[7] According to the Little report this high level of fringe benefits reduces cash wages to workers and creates indefinite future liabilities for employers. This uncertainty makes the employer less willing to plan for expansion. However, in spite of the costs involved, many workers never benefit from much of the money invested. Inflation operates to reduce the real benefits involved. Also, certain features prevent the large majority of workers from ever realizing benefits.

For example, until recently, when pension rights became transferable from one firm to another, possibly only 5% of all employees would receive the theoretical full salary for life.[8] Reasons for this were

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[6] Arthur D. Little, Inc., A Program for the Regional and Industrial Development of Peru, A Report to the Government of Peru (Cambridge, Mass., December, 1960), pp. 38-40.

[7] Many firms pay more in fringe benefits than the law requires. For example, some operate special training and educational facilities, provide in-plant medical service, and transportation to and from the plant (see Appendix E, Item 12).

[8] This 5% figure is mentioned in the Little report, op. cit., p. 40. The fact that pension rights are now transferable was learned during the survey of employers.

TABLE 29

COSTS OF FRINGE BENEFITS IN PERU, 1963

Benefit	Laws Involved	Cost as Percentage of Base Salary	
		White-Collar[a]	Blue-Collar
Severance pay	4916, 1924; 8439, 1936	10.5	10.0
Life insurance	4916, 1924	2.3	-
Paid vacations	7505, 1933	9.1	10.0
Pension after 35 years service	10624, 1946	(8.0)[b]	4.0
Social security	10902, 1948; 8433, 1936	13.0	9.9
Bonus for 30 years service	11725, 1952	1.2	-
Health and welfare fund	11672, 1951	3.5	3.5
Legal bonus	11672, 1951	5.0	2.0
Sickness and maternity insurance	11672, 1951	6.0	-
Accident insurance	1378, 1911	-	4.0
Holiday pay	10908, 1948	-	.33
Sunday pay	7515, 1935	-	16.67
Total		50.6	60.40

a. It should be noted that Peruvian law perpetuates the class structure by making legal distinctions between white-collar (*empleados*) and blue-collar workers (*obreros*).

b. Now included in social security.

Source: Ministerio de Trabajo y Asuntos Indígenas (Ministry of Labor and Indian Affairs), *Informe sobre la participación del Ministerio de Trabajo en el desarrollo economico y social del Peru*, p. 16; and Arthur D. Little, Inc., *A Program for the Regional and Industrial Development of Peru*, pp. 38-39.

that the obligated firm might not stay in business, or may fire the employee before his 35 years were completed. Also, only the larger firms are under such obligations, leaving unprotected those working for small firms. At any rate the theoretical full salary for life would be too much for the needs of the small percentage who would benefit, while the large majority would have too little.

Another undesirable feature of this system is its effect upon the employer's willingness to give the worker a raise. Severance pay is calculated on the basis of one month's pay for every year of service. However, it is retroactive in the event of a raise (see Appendix E, Item 13). The Little report illustrates this in the case of an assumed raise of S/. 500 monthly (about $20) to an employee with 30 years of service.[9] Immediately, the employer must reserve S/. 15,000 (30 times 500) for severance pay and S/. 108,000 for pension pay (500 times 216 months assuming pension payments for 18 years after retirement). Therefore, the S/. 500 monthly raise makes the employer liable for S/. 123,000 (about $4,730). Naturally, the employer is reluctant to increase wages if it means indenturing his future. This would seem to explain partially labor unrest in Peru.[10]

Another very important fact is the lack of management control over staffing. Labor laws and union activity make it difficult for the employer to lay off personnel (once they have completed 90 days of service).[11] Asked if "The difficulty of laying off workers prevents employers from hiring additional workers when needed," eleven out of nineteen large employers strongly agreed and six agreed (see Appendix E, Item 12b).

From this it is probable that the difficulty of laying off workers makes it necessary for the employer to "carry" unneeded personnel during slack seasons and do without needed personnel during boom seasons. In the short run, this appears to benefit the worker by increasing job security. However, in the long run, it probably hurts both employer and worker alike by preventing job expansion.

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[9] Ibid.

[10] A statistical discussion of strikes in Peru is found in SERH, Las huelgas en el Peru, 1957-1962 (Lima, 1963). Other evidence of labor unrest is found in Appendix E.

[11] Little, op. cit., p. 38. Some employers avoid this problem by hiring a contractor to do jobs which, in the United States, would ordinarily call for expanding the firm's personnel (see Appendix E, Item 12b).

Referring back to our previous discussion and the need to create new industrial jobs, it should be pointed out that expanding presently operating industrial firms is the most immediate way to create new industrial jobs. To do this, it seems indicated that cash payments to workers be increased so as to increase the purchasing power of the large majority of the population and thus create a demand for industrial goods.

However, to increase cash payments to workers, fringe benefits may have to be reduced, especially retroactive benefits which prevent the employer from offering a raise. Also, the employer should be given control over staffing so that he can hire additional workers during boom periods. More adequate unemployment compensation seems indicated for those workers who would be laid off during slack periods.

Since neither management nor labor is in a position to implement these changes, other institutions, which can act in the best interests of both, should assume this responsibility.

MISMATCHING OF INDUSTRIAL EDUCATION WITH THE NEEDS OF INDUSTRY. In the Employment Service study referred to earlier in the section "The Employment Situation," it was found with regard to technical education that only 1.9% of the industrial labor force had attended a university, 0.8% had attended a state secondary technical school, and 1.3% had attended a private secondary technical school. In other words, only 4.0% of the members of this large sample (58,718 workers) had received any formal technical education (see Table 30).

TABLE 30

DISTRIBUTION OF TECHNICAL EDUCATION IN THE INDUSTRIAL LABOR FORCE OF PERU, 1962

Level	Percentage of Labor Force
University	1.9
Public secondary technical school	0.8
Private secondary technical school	1.3
Total	4.0

Source: Fernando Romero, *La industria manufacturera y su mano de obra en 1962* (Lima, 1963), p. 138.

The term "technical education" is used here in a very general sense. Henninger points out that in the United States "technical" education is generally offered only at the post-secondary (college) level.[12] At the secondary level in the United States this type of training is generally referred to as "vocational" education. However, in Peru, until the establishment of the School of Technology in March 1964, there were no institutions offering training in this field between the secondary and university level. The graduates of the Industrial Institutes (Institutos Industriales, secondary schools) were referred to as "technicians" (técnicos). The purpose of these institutes (as their name implies) was to train workers for industry. Hence, we here use the terms technical, vocational, and industrial education as virtually interchangeable.

Using figures offered by the Ministry of Development and the U.N. Economic Commission for Latin America (ECLA), Romero calculated that 30,164 workers entered industry in the period 1956-62.[13] If only 0.8% of these had attended the public secondary technical schools, that would mean only 241 (0.8% of 30,164), or less than 11% of those who graduated from the state secondary technical schools in that period, entered industry. As we shall see below, this percentage (which includes women) is somewhat low for the public secondary technical schools for men alone. However, the estimate for men is also disappointing.

The large discrepancy between the percentages of attendance in the public and private secondary technical school is also worthy of comment. Although the number of students enrolled in private secondary technical schools is only about one-sixth of the number enrolled in public secondary technical schools,[14] the number of workers who had attended a private secondary technical school was almost twice that of those who had attended a public secondary technical school (1.3% as opposed to 0.8%). This suggests a difference in quality.

Visits to both types of institutions in the Lima-Callao area revealed that the private secondary technical schools are of a higher quality than their public counterparts. Several reasons came to light (see Appendix G). The main factor seems to be that the administration of the private institutions (almost all run by religious bodies) is far more stable than that of the public institutions. However, in spite of their larger contribution to the personnel of the industrial labor force, most receive no financial assistance from the state.

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[12] G. Ross Henninger, The Technical Institute in America (New York: McGraw-Hill Book Co., Inc., 1959), passim.

[13] Fernando Romero, La industria manufacturera y su mano de obra en 1962 (Lima, 1963), p. 96.

[14] According to the Ministry of Education, 37,487 students were enrolled in the public secondary technical schools and 5,500 in the private secondary technical schools in 1961 (Ministerio de Educación Pública, Dirección de Estadística Educativa, Lima, 1963, pp. 31 and 33).

The discovery of this difference in the stability of the public and private institutions suggests that increasing the efficiency of such institutions in Peru may call for building certain private features into institutional designs. Such features are examined more closely in the later discussion of the Army's industrial training program, the National Apprenticeship and Industrial Labor Service (SENATI), the School of Technology, the Graduate School of Business Administration (ESAN), the Vega Plan, and Recommendation 6, Chart 6 (all in the final chapter). Instability in the public educational sector is reflected in the tendency of one administration to undo the work of previous administrations.[15]

In a study of 523 students graduating from the state secondary technical schools during the period 1950-58, Vega found these graduates employed as shown in Table 31. From this table it can be seen that only 16.3% were actually found working in the specialty they had studied or a related specialty (16.3% plus 36.9%). Some 31% were working in a completely unrelated occupation and the remaining 15.9% (2.5% plus 13.4%) were working in various and unspecified tasks.

TABLE 31

EMPLOYMENT OF PERUVIAN PUBLIC SECONDARY TECHNICAL SCHOOL STUDENTS GRADUATING 1950-58

Specialty Studied	Related Specialty	Unrelated Occupation	Various Specialties	Unspecified Occupation	Total
87	192	161	13	70	523
16.3%	36.6%	31%	2.5%	13.4%	100%

Source: Aristides Vega N. and Edward A. Parker, Informe sobre los problemas de educación industrial, Ministerio de Educación Pública, Servicio Cooperativo Peruano-norteamericano de Educación (SECPANE), (Lima, November, 1959), p. 3.

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[15] This is well documented in Carlos Salazar Romero, Plan nacional de educación pública, Tipografia Sesator, Lima, 1962.

Classifying these same 523 graduates differently, several other important facts are revealed. From Table 32 it can be seen that only 43.3% of this sample of public secondary school graduates found work in existing industrial firms. Although this is high compared to Romero's estimate for both men and women graduates (11%), it is still low when it is considered that the stated purpose of the public secondary institutes is to prepare workers for industry.[16]

TABLE 32

EMPLOYERS OF PERUVIAN PUBLIC SECONDARY TECHNICAL SCHOOL STUDENTS GRADUATING 1950-58

Existing Industrial Firms	Self-Employed	Continuing Study	Employed by the State	Various Employers	Total
227	50	32	132	82	523
43.4%	9.6%	6.1%	25.2%	15.7%	100%

Source: Aristides Vega N. and Edward A. Parker, Informe sobre los problemas de educación industrial, Ministerio de Educación Pública, Servicio Cooperativo Peruano-norteamericano de Educación (SECPANE), (Lima, November, 1959), p. 3.

It appears to be a defeat for the purpose of the technical school that 25.2% of its graduates find jobs with the government instead of in industry.[17] Also, it is probably a substantial waste of funds since technical education costs more than general education.[18] However, as will be seen later, government service is a logical career for these graduates for at least two reasons. First, there is an insufficient number of jobs available in industry. Second, a graduate of a secondary school in Peru is a member of an educated elite (since there are so few of them, 12.6% of total school enrollment according to Table 18). For this reason, his first choice would be a white-collar job.[19]

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[16] Later, the feasibility of self-employment for these graduates will be investigated (see the Vega Plan in a later section).

[17] Some of these work as public school teachers in pre-vocational schools.

[18] The annual cost per pupil in secondary general education during 1962 was \$84.45 while that of secondary technical education was \$127.49 according to the Ministerio de Educación Pública, Informe sobre el desarrollo de la educación en el Perú durante el año 1962 (Lima, July, 1963), p. 5. An important treatment of the relative merits of investment in general as distinct from technical

Even more disappointing were the findings with regard to salaries as shown in Table 33. From this table we can see that there is an unusually high percentage (35%) who are working without salaries (as apprentices, for family enterprises, as helpers). Also, when the study was done in 1959, only 3.6% were receiving salaries of S/. 1,500 ($55) or more monthly. This compares with a mean monthly wage for blue-collar workers during the period July-September 1962 of S/. 1,560 ($58).[20]

That is, these wages (received by the technical school graduates) were low even when compared with the general average. This is very disappointing since the average industrial worker has far less than a secondary school education.[21] Vega states that wages for this level industrial worker were, at the time of the sample, S/. 30 to 50 ($1 to $2 per day). This situation has changed little since 1959 because the average daily wage in non-agricultural or mining activities in the period January-March 1963 was S/. 48 (a little less than $2).[22]

These data suggest the necessity of raising the income of this group. One way this might be done is suggested by the finding that

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education is found in Philip J. Foster, "The Vocational School Fallacy in Development Planning," a paper presented at the Conference on Education and Economic Development, Comparative Education Center, University of Chicago, April 4-6, 1963. Frederick Harbison, a noted expert in the field of allocation of funds for human resources development, takes the position that, unless technical education can be closely tied to industry, general education is usually a more economic investment.

[19] Also, between white-collar and blue-collar workers there is a legal distinction, indicating a difference in status (see Table 29).

[20] Derived from data on p. 15 of Ministerio de Trabajo y Asuntos Indígenas, *Informe sobre la participación del Ministerio de Trabajo en el desarrollo económico y social del Perú* (Lima, 1963).

[21] The probable explanation for this phenomenon is that the graduates of the secondary technical schools compete among themselves for the very few available jobs and thus drive down their wages.

[22] *Supra*, p. 51, footnote 19.

60% of any increase in national income appears to go to ownership and management (see Table 16).[23] That is, the present small percentage of this group (9.6) which becomes self-employed, should be raised. The problem, of course, is that the large majority of these graduates (a year younger than U.S. high school graduates) lack the maturity, technical knowledge, and financial resources to employ themselves.[24]

TABLE 33

MONTHLY SALARIES OF PERUVIAN PUBLIC SECONDARY TECHNICAL SCHOOL STUDENTS GRADUATING 1950-58 (SOLES)

Without Salary	1,000 or Less	1,001-1,500	1,500 or More	Total
183	241	80	19	523
35%	46.1%	15.3%	3.6%	100%

Source: Derived from Aristides Vega N. and Edward A. Parker, Informe sobre los problemas de educación industrial, Ministerio de Educación Pública, Servicio Cooperativo Peruano-norteamericano de Educación (SECPANE), (Lima, November, 1959), p. 5.

Table 34 refers to the job satisfaction expressed by these 523 graduates. From this table it can be seen that over half of the graduates expressed discontent. Among the major causes of this discontent were: (1) very low salaries received, (2) employment in fields unrelated to those studied, and (3) lack of vertical mobility (see Recommendation 4, Chart 6).

Another indication of the quality of public secondary technical education is indicated by the dropout rate. Table 35 represents a typical school in May 1964 in Lima. It can be seen that students in

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[23] Staley (see Preface) points out that the small operator, having few workers with whom to share his profit, would probably receive even more than 60%.

[24] See the Vega Plan in a later section, which proposes to give these graduates additional training (business administration) and Recommendations 1a, 2a, and 2b, Chart 6, which recommend keeping these young people in school longer by reducing dropout and improving educational opportunities at the post-secondary level.

TABLE 34

JOB SATISFACTION EXPRESSED BY PERUVIAN PUBLIC SECONDARY TECHNICAL SCHOOL STUDENTS GRADUATING 1950-58

Content	Discontent	Undeclared	Total
134	300	89	523
25.6%	57.4%	17%	100%

Source: Aristides Vega N. and Edward A. Parker, Informe sobre los problemas de educación industrial, Ministerio de Educación Pública, Servicio Cooperativo Peruano-norteamericano de Educación (SECPANE), (Lima, November, 1959), p. 6.

TABLE 35

ENROLLMENT OF A TYPICAL PUBLIC SECONDARY TECHNICAL SCHOOL IN LIMA, PERU, MAY 1964

Grade	Number of Students	Percentage of Total	Percentage of Dropout from Previous Grade
1	230	36	-
2	138	23	60
3	81	13	59
4	90	15	-
5	78	13	-
Total	617	100	

Source: Figures are those of the Instituto Nacional de Educación Industrial No. 28 "Vice Almirante Manuel A. Villavicencio" obtained by interview.

the last year of study comprise only 13% of the student body, whereas students in the first year comprise 36%. Grouped together, students in the first and second years of study comprise 59% of the student body, whereas students in the last three years comprise the remaining 41%. School dropout is heaviest between the first and second years of study (60%) and between the second and third years (59%). After that, dropout is negligible. However, Staley (see Preface) points out that an increase in enrollment might also cause this dropout effect by decreasing the advanced classes as a percentage of the total student body. For this reason, in more aggregate terms, Table 36 traces a single class for a four-year period.

TABLE 36

STUDENT RETENTION IN THE PUBLIC SECONDARY TECHNICAL SCHOOLS FOR MEN IN PERU, 1953-56

Year	Grade 1	Grade 2	Grade 3	Grade 4	Percentage of Students Retained
1953	1,915				100
1954		1,056			55
1955			816		43
1956				679	36

Source: Aristides Vega N. and Edward A. Parker, Informe sobre los problemas de educación industrial, Ministerio de Educación Pública, Servicio Cooperativo Peruano-norteamericano de Educación (SECPANE), (Lima, November, 1959), p. 18.

As seen in Table 36 the dropout of students in a four-year period was 64% (or the retention rate was 36%). Since 1956 an additional year of study has been added which would probably raise this dropout percentage. In 1959 the state had 41 secondary technical schools for men in the nation (see Recommendations 2a and 3, Chart 6). At the rate of 64% desertion, Vega figures that by increasing retention the state could produce the same number of graduates with about 27 schools (instead of the present 50 or more).[25]

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[25] Aristides Vega N. and Edward A. Parker, Informe sobre los problemas

The reason for this is that the money saved could be devoted to equipping and staffing properly the reduced number of schools. Visits to the state secondary technical schools of the Lima-Callao area confirmed that the present schools are very poorly equipped. Of twelve school directors asked, all stated that they were unsatisfied with funds and equipment available to their schools (see Appendix G). Properly to train their present students most of these schools need from two to five times as much money and equipment.

Vega points out that almost all of these 41 institutions in 1959 were training students at the same level and in the same specialties. By 1962 the number of these institutions had risen to 52 and the same conditions obtained. These specialties were listed previously (Table 25). However, this level and these specialties are not the ones presently in demand in existing industrial firms (see Appendix E).[26]

This indicates that the level of training should be raised and these schools should be differentiated one from the other (see the discussion of the School of Technology in a later section and Recommendations 2b and 3, Chart 6). Vega suggests regional institutes devoted to the training most needed in local industry.[27]

The Ministry of Education reports that in 1961 there were 2,400 secondary technical school teachers for 18,439 students (a ratio of one instructor for eight students); there were 6,700 secondary general school teachers for 119,849 students (a ratio of one instructor for

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de educación industrial, Ministerio de Educación Pública, Servicio Cooperativo Peruano-norteamericano de Educación (SECPANE), (Lima, November, 1959), p. 19. William Mason, Regional Manpower Expert, International Labor Office (Lima), feels that less than half this reduced number of schools (10 instead of 27) might be sufficient under certain circumstances.

[26] In a study of Ecuador, focusing on technical training at the university level (engineering) McCusker found the same mismatching of education and the needs of industry as is evident in Peru. It seems that Ecuador's universities are producing an oversupply of civil and chemical engineers while industry requires more industrial, mechanical, and electrochemical engineers: Henry J. McCusker, Jr., and Edward A. Podesta, Manpower and Educational Planning in the Socioeconomic Development of Ecuador, A Report to the Government of Ecuador (Menlo Park, Calif.: Stanford Research Institute, February, 1964).

[27] Vega, *op. cit.*, p. 22.

eighteen pupils).[28] These extremely favorable ratios seem highly unrealistic for Peru. In most nations at a similar stage of development the teacher/pupil ratio would be closer to 1:50.

With this information we can now attempt a summary of the conditions in public secondary technical education in Peru. The following characteristics are observed:

1. A large number of schools offering undifferentiated occupational training,
2. A large but poorly trained administrative and teaching staff,
3. Very limited funds for materials or equipment maintenance, and
4. Too many pupils for the equipment on hand.

Some of these characteristics require further explanation. So far nothing has been said about the size or the professional competence of the administrative staff. This second assertion (above) rests on the observation of the author that such personnel were abundantly in evidence in all the schools visited. In the new facilities of the Politécnico Nacional "José Pardo" (then under construction) it was found that the administrative building was the largest (the only two-story structure) of all the buildings. However, it was also found that none of the directors of any of the technical schools in the Lima-Callao area was able to give detailed data on the job placement of graduates (see Appendix G, Item 10).

It has been pointed out that the teacher/pupil ratio in secondary technical schools would appear to be a favorable 1:8. However, it was learned that very few of these instructors have ever had industrial experience. This differs very sharply from U.S. technical schools where faculty members typically have had several years of industrial experience. Combined with other data this favorable student/teacher ratio seems to indicate, not high quality education, but merely that the educational system is itself employing the educated personnel which industry cannot absorb.[29]

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[28] Extracted from pages 11 and 44 of Ministerio de Educación Pública, Estadística educativa, 1957-1961, Complemento del inventario de la realidad educativa del Perú (Lima, 1963).

[29] Taking an informal survey to find out why so many people were found on lines within the Ministry of Education whenever it was visited, the author discovered that most of these people were seeking jobs for themselves or for their friends or relatives.

With regard to the funds available to school directors for materials and equipment purchase and maintenance, Vega points out that little provision is made for such expenses.[30] As support for the assertion that too many students have been enrolled, we offer the fact cited earlier (see Table 31) that only about 16% of the graduates find work in their subjects of study.[31]

It seems necessary to explain these characteristics of secondary technical education. One hypothesis can be brought out by asking the question:

Who benefits by maintaining these characteristics?

Chart 2 attempts to answer this question. One is forced to conclude from this chart that groups with high political power derive the most benefit from the present conditions of public secondary technical education in Peru. This would tend to explain the unusual stability of these characteristics in spite of high political instability of the government itself. However, as will be mentioned below, this condition is only in the short-term interests of these groups.

If we change the actual characteristics of the technical education system to the following:

1. A small number of schools (offering a varied program corresponding to the needs of industry),
2. A small but well trained administrative and teaching staff,
3. Adequate equipment,
4. Sufficient funds for materials and equipment maintenance, and
5. Fewer pupils (but a high percentage of job placement),

then Chart 3 answers the question:

Who benefits from changing the characteristics of the present technical education system?

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[30] Vega, op. cit., p. 23.

[31] Hector Correa in his The Economics of Human Resources (Den Haag Brukkeriji Pasmans, 1962), p. 209, concludes that, "The equilibrium values of the economic system, that the values for which unemployment is zero, can be obtained only if the educational system grows at the rhythm determined by the economy, or if the economy grows at the rhythm determined by the output of the educational system."

CHART 2

WHO BENEFITS BY MAINTAINING THE PRESENT CHARACTERISTICS OF PERUVIAN SECONDARY TECHNICAL EDUCATION FOR MEN?

	Amount of Political Power	
	Low	High
Question:	Answer:	
Who benefits from:		
1. A large number of schools?	The workers who work for the construction contractors	The construction contractor who builds the schools
2. A large administrative and teaching staff?		The administrators and teachers who receive the wages
3. Inadequate equipment?		The government which can spend its funds on projects of greater political value
4. Insufficient funds for materials or equipment maintenance?		Ditto
5. Too many pupils?		The government which can claim that it is providing education for a large number of students

Stated in this way, it seems that for the most part, the undesirable features of the present technical education system are serving the interests of the politically most powerful interested parties: the construction contractors, the government itself, and the educational administrators and teachers. However, maintaining these undesirable features in the technical education system serves only the short-range interests of these politically powerful groups.

CHART 3

WHO BENEFITS BY CHANGING THE CHARACTERISTICS OF THE PRESENT PERUVIAN SECONDARY TECHNICAL EDUCATION FOR MEN?

	Amount of Political Power	
	Low	High
Question:	Answer:	
Who benefits from:		
1. A small number of schools offering a varied program?	The students who would learn a marketable skill more rapidly	
2. A small but well trained administrative and teaching staff?	Ditto	
3. Adequate equipment?	Ditto	The machinery manufacturer or importer who would sell the equipment to the government
4. Sufficient funds for materials and equipment maintenance?	Ditto	
5. Fewer pupils but a higher rate of placement?	Ditto	

Would not their long-range interests be better served if they used their political power on behalf of the interests of the temporarily politically less powerful interested party? This is how it might work: An efficient technical education system would increase the productivity of industry. At the same time, by providing higher incomes for presently low-paid workers, it would distribute purchasing power more widely in the population.

Simply stated, this could mean a larger market for goods and services of all types. Specifically, in Peru it would mean an increased demand for: housing (from which the construction contractors would benefit) and education (from which the educational administrators and teachers would benefit). Then, of course, the increased personal and corporate income generated would be subject to taxes (from which the government would benefit).

Of course, as pointed out before, politically powerful groups cannot always be depended upon, or expected, to act in their own long-range interests. For this reason, special institutions may have to be set up which can act in the long-range interests of all concerned.[32] A main function of at least one of these institutions would have to be to inform the public of its own best interests and to generate support for all the concerned institutions.[33]

UNFAVORABLE ATTITUDES TOWARD INDUSTRIAL EMPLOYMENT. Referring back to the section "Income Size and Distribution," we were interested in the question of why so few of the graduates of state secondary technical schools and the university departments of engineering found work in industry. So far we have indicated that the main reason was simply that there was an insufficient number of industrial jobs available. Second, we have indicated that the level and type of training of the majority of these graduates was inappropriate. In this chapter we consider the possibility that attitudes of students, educators, and employers were unfavorable.

Before attempting this it should be pointed out that those who study attitudes distinguish among the various "components" of attitudes. Here we shall be concerned with the "cognitive" and the "behavioral" components. In non-psychological terms this distinction might be thought of as being the same as the distinction between "professed" and "actual" attitudes. This is a very important distinction for our study.

For example, in response to a large range of statements concerning education and industrial development there were few significant differences of opinion among employers, technical school directors, and educational experts in the Lima-Callao area. There was generally positive response to the following statements (see Appendices E, F, and G):

1. Vocational guidance should be based equally on job opportunivites and the student's personal preferences and abilities.

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[32] See discussion of SENATI, The School of Technology, ESAN, the Vega Plan, and Recommendation 6, Chart 6, in the final chapter.

[33] See specifically Recommendation 6, Chart 6.

2. The school should teach the technology which would increase the student's productivity as a worker.

3. Educational authorities should consult regularly with employers.

4. All educational institutions should operate a service to assist their graduates in finding suitable employment.

5. School authorities should dignify manual work and make information about employment opportunities in this field readily available.

However, this response might be considered to be the cognitive component of the attitudes involved. The behavioral component would have to be inferred by observing the behavior of the respondents. For example, although most school directors professed that they believed that vocational guidance should be based on job opportunities (1 above), few had made a systematic study of such opportunities. Again, although most school directors readily agreed that the school should teach the technology that would increase the student's productivity as a worker (2 above), few schools were offering training which corresponded to the needs of industry.

Most school directors agreed that educational authorities should consult regularly with employers (3 above). Yet 13 out of 19 employers interviewed stated that the school directors never consult with them. The remaining 6 employers did not commit themselves to a yes or no answer (see Appendix E, Item 9).

Most school directors agreed that all educational institutions should operate a service to help their graduates find suitable employment (4 above). Yet none of the institutions visited was operating a formal employment service. Most directors agreed that school authorities should dignify manual labor and make information about employment opportunities in this field readily available (5 above). Yet, as pointed out in the foregoing remarks, little effort was being made to encourage students to enter undersupplied fields or to collect data on employment opportunities.

As a further illustration of this last point, it was found that many of the institutions visited had scores of portraits painted or hung on the walls. Inquiring as to whether any of these men were machinists, technicians, scientists, or inventors, it was learned that they were lawyers, statesmen, poets, writers, military men, and patriots. Certainly, if the technical school directors were serious in their professed desire to dignify manual labor (5 above), the pictures hanging on the walls of their schools would model more appropriate outcomes for their students.

With regard to the attitudes of students, a previous study found significant results.[34] Briefly, it was found that Peru does not have a tradition of industrial leadership. Many of Peru's most prominent industrial leaders are foreigners or the sons of immigrants. A sharp distinction is made between white-collar workers (empleados) and blue-collar workers (obreros). (See also Table 29.) Peruvians employ only one word for each of these concepts whereas U.S. citizens must awkwardly employ three. More prestige is associated with white-collar than with blue-collar occupations.

To test this hypothesis Whyte employed an attitude scale. The hypothesis was confirmed by the fact that only 13.3% of the 1,834 male respondents in the final year of high school chose to be an obrero when offered the same pay as an empleado. Of this large sample 31.1% chose obrero only if they would receive an additional S/. 300 ($12) per week. Some 35.6% chose "Under no circumstances would I be an obrero."

Another finding of importance to our study was that the students of the elite secondary private schools had significantly poorer attitudes toward academic work when compared with the students of the public secondary schools. The probable reason for this is that the more privileged students realize that they will receive the rewards whether they work or not (see mention of the "forty families" that dominate the economic life of Peru, supra p. 3). On the other hand, the less privileged students realize that, with limited opportunities available to them, they must work.

Returning to the main train of thought of this study, it seems from the above discussion that some of the graduates of the technical secondary schools and the engineering departments of the universities may have decided not to join the industrial labor force simply because (for prestige reasons) they did not want this type of employment.

As high school and university graduates, they were members of an educated elite (see Table 18 and the discussion of the educational structure of Peru). As such, some may have had their choice of a number of jobs other than jobs in industry. The cure for this attitude seems to be to produce a larger number of graduates (in all fields) at both the secondary and university levels. If there were more such graduates, there would be less likelihood that graduates would risk competing in fields other than their specialty.

Although not mentioned by Whyte in his study, the unfavorable attitude of students toward industrial employment may be functional.

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[34] Reported in William F. Whyte, "Culture, Industrial Relations and Economic Development: The Case of Peru," Industrial and Labor Relations Review, Vol. 16, No. 4 (July, 1963).

Since there are about 14 applicants for every industrial position, it is just as well that some graduates are not interested in such work.[35]

We turn now to some of the major solutions to the problems we have been discussing. These solutions are:

1. The Army's industrial training program,
2. The National Apprenticeship and Industrial Labor Service (SENATI),
3. The School of Technology,
4. The Graduate School of Business Administration (ESAN), and,
5. The Vega Plan for training small industrialists.

In addition, several less well developed schemes are considered. They include proposals either to increase the number of jobs available or to decrease the number of jobs demanded by means of:

a. Offering part-time work combined with part-time study for the presently unemployed,
b. Withdrawing part of the present labor force for full-time training, and
c. Deferring employment for some students by financing further study and expanding higher level educational facilities.

Quoting Harbison: "As [Jan] Tinbergen has stated, the heart of development programming consists of the appraisal of individual projects and the rational selection of those to be included in the overall plan."[36]

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[35] This 14 to 1 ratio is not pressed here as it was an informal estimate of Robert Hemingway, UNESCO advisor to the Ministry of Education on technical education. However, the data offered earlier in the first chapter from the Employment Service strongly suggest such a ratio.

[36] Frederick Harbison and Charles Myers, Education, Manpower and Economic Growth: Strategies of Human Resources Development (New York: McGraw-Hill Book Co., Inc., 1964).

SOLUTIONS TO THE PROBLEM

THE ARMY'S INDUSTRIAL TRAINING PROGRAM.[1] The Peruvian Army has begun a program of training recruits in the last three months of their enlistment. In operation for about one year, the program now has about 225 students in each of four cycles annually. It is expected that the program will expand from its present output of some 2,000 semi-skilled workers per year trained in the Lima and Cuzco establishments, to a combined total of 8-10,000 per year trained in each of the five military districts: Lima, Cuzco, Arequipa, Iquitos, and Piura (see Figure 2).

The program is partly based on the fact that many of the recruits, originally from rural areas, will remain in the urban centers, where the military establishments are located, after they are discharged. Therefore, it is primarily designed to give them a skill which will enable them to find urban employment. However, it is expected that those who return to their former rural homes will also be better qualified for jobs.

The training is at the craftsman level. As such, it is doubtful that many of these trainees will find jobs with the large industrialists, who need few workers at this level (see Appendix E, Item 10). Nevertheless, a large Lima utility company has agreed to take many of those who study electricity. The training is mostly in the construction fields: carpentry, plumbing, masonry, bricklaying.[2]

Since these trainees are studying subjects similar to those studied by the secondary technical school students, they are apt to be competing with these graduates for jobs. However, the Army graduates have at least one advantage. They are three to five years older on the average than the graduates of the secondary schools. The Army trainees range from about 19 to 23, whereas the secondary technical graduates range from about 16 to 18. Then again the Army program emphasizes self-employment, whereas the secondary technical schools emphasize employment in existing firms.

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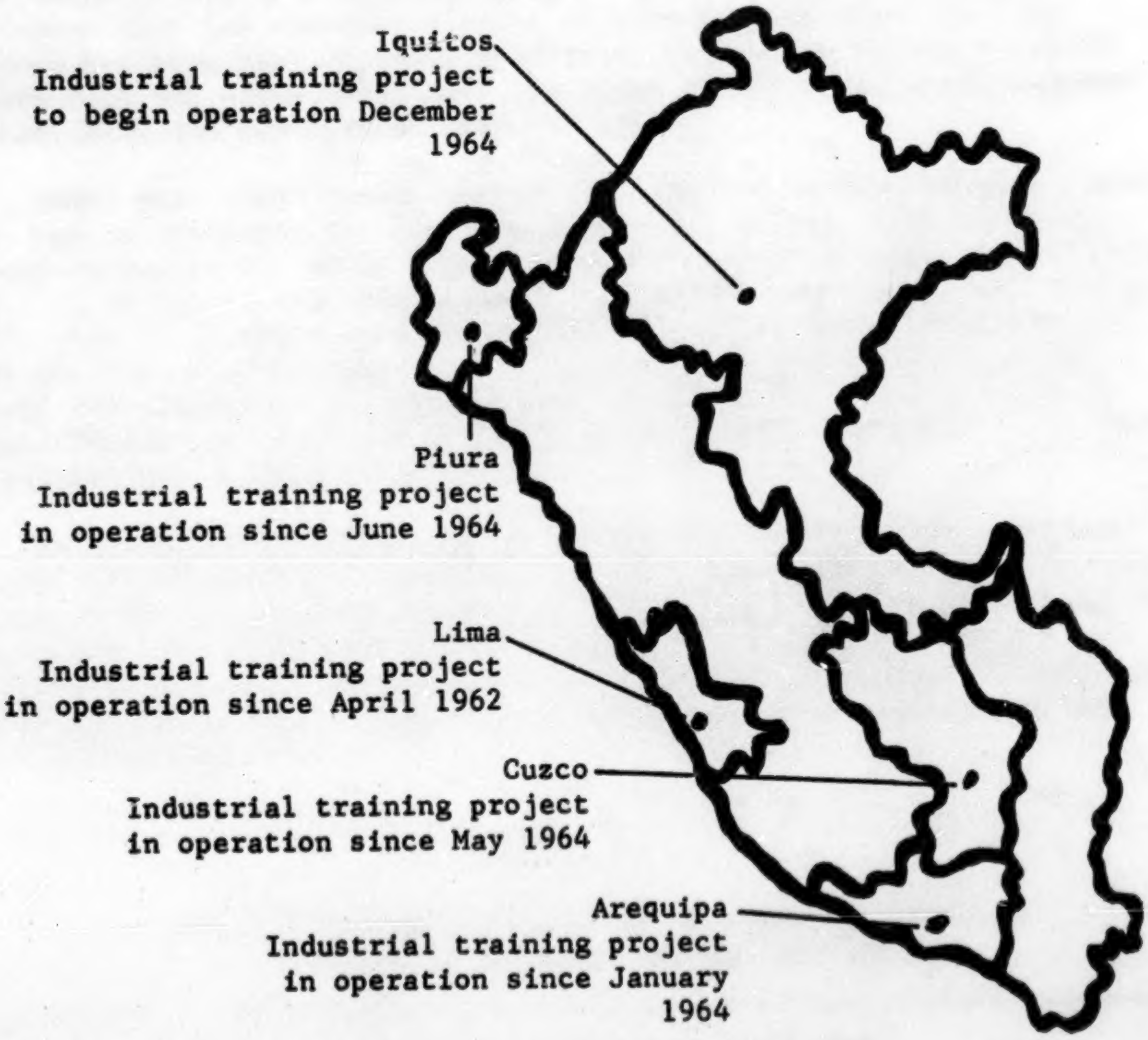
1. Most of the data in this section come from an interview with Robert L. Spence, USAID advisor to the program at Chorrillos (a suburb of Lima).

2. It should be recalled (see Table 9) that the construction sector is the sector predicted to experience the largest relative increase in employing capacity.



Iquitos
Industrial training project
to begin operation December
1964

Piura
Industrial training project
in operation since June 1964

Lima
Industrial training project
in operation since April 1962

Cuzco
Industrial training project
in operation since May 1964

Arequipa
Industrial training project
in operation since January
1964

FIGURE 2

MILITARY REGIONS OF PERU AND INDUSTRIAL
TRAINING PROJECTS

Source: U.S. Agency for International
Development in Peru (USAID-Peru)

So far a fairly high percentage (possibly 70%) of the graduates of this newly established military program have been placed in jobs.[3] This indicates that the economic effects of this program might be high. Without training most of these graduates, illiterate before being inducted into the Army, would join the ranks of the unemployed, underemployed, or those employed at very low wages.

Asked what these trainees might be expected to earn without training, Spence estimates S/. 20 to 30 (about $1) a day. With training, Spence estimates S/. 80 to 90 (about $3) a day, or an additional $2 per day. If we figure that the average trainee will work about 200 days a year, this is an additional $400 a year ($2 times 200). When the program matures, 10,000 trainees will graduate per year. If we assume a modest 50% placement, this would mean an additional $2 million of national income per year (50% of $400 times 10,000). However, this type of program has a compounding effect.

As a simplified illustration, assume that the program is already mature (10,000 graduates annually) and that the training takes one year. In the first year after graduation 5,000 of the 10,000 graduates earned $2 million more than they ordinarily would have. Meanwhile, another 10,000 trainees have graduated and 5,000 of them have begun to earn an additional $2 million. This type of effect is best shown by the use of a table (Table 37).

TABLE 37

POSSIBLE ECONOMIC EFFECTS OF THE PERUVIAN ARMY'S INDUSTRIAL TRAINING PROGRAM 1964-68

	Effect on the Economy ($000,000)					
Graduating	Year after Graduation					Total
Class	1964	1965	1966	1967	1968	
1963	2	2	2	2	2	10
1964		2	2	2	2	8
1965			2	2	2	6
1966				2	2	4
1967					2	2
Total						30

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[3] Estimated by Spence.

Table 37 indicates that the class graduating in 1963 earns $2 million more in 1964 than they ordinarily would have. Therefore, in the five-year period 1964-68 they earn an additional $10 million. While the class of 1964 was earning their first additional $2 million, the class of 1964 was being trained (hence the space in the square 1964-1964) and earns its first additional $2 million in 1965, and so on. This amounts to an additional $30 million in the five-year period 1964-68.

Of course, no claim to exactness of prediction is made for these figures. First of all we assumed immediate maturity of the program whereas only some 2,000 per year are presently being graduated. Also, we assumed that the wages offered to these graduates would remain constant even after large numbers began competing for the same type of jobs. On the other hand, we assumed a full year of training. Actually, the full course takes only three months. Also, we took only a five-year period and as can be seen from Table 37 a training program of this type is least productive in the early stages.

However, the feature of greatest interest to us is not so much the amount of income which might be generated, but rather the distributional effect of the program on income. As suggested earlier this program develops marketable skills for workers who ordinarily would be unemployed, underemployed, or employed at very low wages. As such, the crucial part of the program is the placement of the graduates. As mentioned before, an alternative to this would be self-employment.

Presently, Spence is trying to obtain funds to supply the graduates with the tools of their trade. Obviously, without such tools, this alternative is not workable. Also, as suggested elsewhere, these graduates would not have the high level of skill needed in the majority of the large industrial firms. Hence the expansion of small-scale industry seems to be a necessary complement to the program.

A feature of great importance in this program is the possibility for continuity and stability. Training programs of all types need a long lead-time to realize the benefits of their investments. The continual administrative change in the present public school system does not contribute to this kind of continuity and stability.[4] On the other hand, the Army (also the church and private industry) is one of the most stable institutions in Peru.[5] As such, it may be able to provide the necessary continuity.

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[4] See Carlos Salazar Romero, Plan nacional de educación pública, Tipografia Sesator, Lima, 1962, for a description of the continual "reform" of education caused by political changes in the Ministry of Education.

[5] It is true that in the past these institutions have not always been

THE NATIONAL APPRENTICESHIP AND INDUSTRIAL LABOR SERVICE (SENATI).[6]

Concerned with workers already on the job, the National Apprenticeship and Industrial Labor Service (*Servicio Nacional de Aprendizaje y Trabajo Industrial*--SENATI) is the major training-within-industry program in Peru. Advocated by industrialists, SENATI was created by Law 13771 signed on 19 December 1961 by then President of the Republic, Manuel Prado.

It is a semi-private organization with a full-time director and staff backed by a board of directors including representatives from the National Society of Industries, the Ministry of Development and Public Works, the Ministry of Public Education, the Ministry of Labor and Indian Affairs, and the Peruvian Federation of Labor. It is financed by a monthly tax of 1% on the first S/. 6,000 ($222) of all wages and salaries of employees (white- and blue-collar) working in firms of twenty or more workers. This gives SENATI some $1 million annually, but adds fixed expenses in addition to those already borne by employers for fringe benefits.

In 1962 there were 1,272 firms with twenty or more workers in registered industry in Peru (see Table 27). By law these would belong to SENATI. Table 38 shows the structure of such firms in the Lima-Callao area.

It should be pointed out that whereas the Lima-Callao area has about 75% of all industrial firms of the nation and 65% of all industrial workers, this total (69,953) represents only about 40% of all workers employed in registered industry in 1962 (151,674). Also, the largest percentage of workers, some 71% (20% plus 27% and 24%), belong to firms of 100 or more workers.

In fact, the average number of workers employed in all the firms which legally belong to SENATI is 101. Law 13771 affects only registered industry, that is, those which for tax reasons and for reasons of obtaining patents from the state are registered with the Ministry

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progressive, but the fact that the Army is now undertaking the "civic action" program described in this section, the church is running some of the best technical schools in the nation (see section "Mismatching of Industrial Education with the Needs of Industry" in the second chapter), and private industry has established a national apprenticeship service (to be considered in the next section), is evidence of a significant and important break in tradition.

[6] Material in this section comes mostly from interviews with SENATI National Director, Fernando Romero, and material which he generously provided August 1963-June 1964.

of Development. The number of such firms is small compared with the large number of small enterprises (home and cottage industries and artisan activities) but it has been necessary to proceed in this manner because these small enterprises, in the majority of cases, pursue their activities without state control. In fact, their very number is unknown. Perhaps the results of the industrial Census (about to be realized) will supply appropriate information.

TABLE 38

STRUCTURE OF FIRMS BELONGING TO SENATI IN THE LIMA-CALLAO AREA, 1962

Size of Firm	Number of Firms	Percentage of Total	Number of Workers	Percentage of Total
20-49 workers	270	44	8,401	12
50-99	165	27	11,679	17
100-199	94	15	14,141	20
200-499	59	10	18,807	27
500 and more	24	4	16,925	24
Total	612	100	69,953	100

Source: Fernando Romero, La industrial manufacturera y su mano de obra en 1962 (Lima, 1963), p. 114.

To get some idea as to how to proceed in its assigned task, SENATI contracted with and assisted the Employment Service in conducting the survey of industry previously mentioned (see the discussion of Table 19 in the first chapter). Of 604 industrial firms employing 58,718 workers in the Lima-Callao area, the management of 348 establishments indicated that 8,323 (14.2%) of their workers required additional training. Of these, 29% were said to require basic apprenticeship training, 55% additional in-service training, and 16% specialization in some field.

Acting to reduce this deficiency SENATI has offered intensive courses to secure primary and secondary school certificates to qualify workers for later technical training. The expenses of this operation have been reduced by the use of the facilities of the Ministry of Education when they were idle in the evenings and summers.

In this manner, taught by some fifteen experienced public school teachers, indoctrinated in the purpose of SENATI and the methods of adult education, over 500 workers were able to complete the courses during 1963.[7] In addition, at the time of writing this report, over 100 workers have been sent to six countries to prepare themselves to become technical instructors for SENATI. These countries include Brazil, Colombia, England, Germany, and Holland.[8]

As of June 1964 SENATI began construction of its own training center to have 32 shops and 32 classrooms capable of accommodating 1,200 students.[9] This would make possible a graduating class of perhaps 4,000 students annually if we assume that the training is of about one year's duration. However, SENATI plans to expand to other cities and to conduct the same type of program. Hence, this figure must be considered as a conservative estimate.

In the case of SENATI, training persons already employed, there is no problem of placement as in the case of the secondary technical schools and the Army's industrial training program which we have already considered. Hence we can assume that 100% of the trainees will be able to use their training on the job. This compares with

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7. In an August 1964 letter to the author Dr. Romero reports that the courses completed in 1963 were of an experimental nature. Based on this experience 4,395 worker-students have now been matriculated in 25 schools in Lima-Callao and 700 such students in Arequipa.

8. It should be mentioned that SENATI is not an isolated experiment. By Law 4048 of 22 January 1942 Brazil set up SENAI, a similar organization run by the Confederation of Industries. In 1956 it had 109 schools with 117 courses attended by 29,585 students. Colombia, by Laws 0118 and 0146 of 6 August 1957 set up SENA. Both of these organizations have run successful training-within-industry programs. The Argentine program (CNAOP) set up by Law 14538 of 3 June 1944 had 119 schools in 1949 with 31,000 students but has taken an academic rather than an apprenticeship bent. Older than any of these Latin American models, a similar organization in Europe, the Copenhagen Technological Institute, has demonstrated the vitality of this institutional design by functioning effectively for over 60 years. (Sources: Fernando Romero; A. Nunez Melendez, Project Officer, Training Division, United Nations Special Fund; and Joseph Stepanek and Richard Roberts of Stanford Research Institute)

9. Both Alejandro Tabini, President of SENATI's National Council, and Dr. Romero have been in Washington, D.C., attempting to negotiate a loan to equip this center.

only 16.3% of the graduates of the secondary technical schools who were able to find work in the specialty studied (see "Mismatching of Industrial Education with the Needs of Industry").

We found that the Army industrial training program might increase the trainee's earning capacity by 200% (from $1 daily to $3). To get some idea of the possible income effects which the SENATI program might have, consider the blue-collar wage structure of 20 (out of a possible 22) firms classified as basic metals industries (according to the classification system of the International Labor Office) in the Lima-Callao area during the period July-September 1962.[10] In a total of 469 workers, receiving S/. 17,885 in daily wages, the mean daily wage of all workers receiving the maximum in their occupational category was S/. 59 ($2.10). That is, there is a mean difference of S/. 30 or 100% between the minimum wage and the maximum wage in any one occupational category.

The purpose of SENATI is to increase the skill of employed workers. From the data just cited, it appears that the most competent workers in each category receive approximately twice (100% more than) that received by the least skilled. That is, we might expect that SENATI, if it concentrates on improving the skills of the least skilled members of the industrial labor force, might double their income. However, if it concentrates on improving the skills of the most skilled workers, it may, by increasing output, increase the incomes of the employers, but have little effect on the income of low-paid workers.

In the case of the Army's program we estimated that the effect of training would be to triple income (increase it by 200%). In view of our estimate for already employed members of the industrial labor force the Army estimate would seem high. However, the Army starts with personnel whose earning potential is initially lower than that of the employed members of the industrial labor force. Also, the Army plans on self-employment for many of its trainees and, as pointed out before (see discussion concerning Table 16), self-employed personnel are likely to receive a large share of the income generated by their enterprise.

The average of all wages paid to workers in manufacturing industry in the Lima-Callao area in the period July-September 1962 was S/. 52.[11] Using the same number of working days in the year as employed before (200), this would be an annual wage of S/. 10,400 ($385). However, we assume that the workers to be trained by SENATI are earning less than the mean wage. Therefore, we can accept $300 a year as a fairly realistic mean wage for SENATI students.

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[10] These data are found in Servicio del Empleo y Recursos Humanos (Employment and Human Resources Service), SERH, Bulletin No. 1 (June, 1963), unpaginated, *passim*, in undigested form. All figures are rounded to whole soles.

[11] *Ibid*. Calculated from data in *Cuadro* No. 4.

Once again, to simplify our illustration, we assume that the training lasts one year and that we begin with a mature program (4,000 students).[12] If each of the 4,000 students doubles his income as a result of SENATI training, this would be an additional $1.2 million ($300 times 4,000) which ordinarily would not have been earned. The cumulative effect of this can be shown by Table 39.

TABLE 39

POSSIBLE ECONOMIC EFFECTS OF SENATI, 1963-68

Graduating Class	Effect on the Economy ($000,000) Year after Graduation 1964	1965	1966	1967	1968	Total
1963	1.2	1.2	1.2	1.2	1.2	6.0
1964		1.2	1.2	1.2	1.2	4.8
1965			1.2	1.2	1.2	3.6
1966				1.2	1.2	2.4
1967					1.2	1.2
Total						18.0

Table 39 shows that the possible cumulative effect of SENATI in the five-year period 1963-68 could amount to $18 million. The cost during that period would be about $1 million annually or $5 million total, which means a gain of $13 million. Much of this gain would go to workers presently earning relatively low salaries. Also, it should be pointed out that, as in the Army program, the maximum results are not realized unless the program is continued for a long period of time.

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[12] As indicated in footnote 7, supra, p. 70, this 4,000 figure is conservative. Also, a recent letter (again see footnote 7) reveals more precise information about the length and nature of the training program. The curriculum now calls for 14 months of work-study (eight months of study at the new National Center and six months of apprenticeship on the job).

Once again, it might be argued that, by training these large numbers of industrial workers, the wages for skilled labor would decline. This is possibly true, although with the large deficits now existing it is not anticipated in the near future. With the increased number of skilled workers in the labor force, it is also probable that industrial productivity would increase, raising wages for all.

A point strongly in favor of SENATI's success is the fact that its administration is likely to be more stable than that of programs which are completely government controlled. The large firms which support it have been in existence (and possibly under the same management and control) in Peru during many changes of national administration.[13] Part of the reason for this support is the fact that owners and managers of these firms stand to benefit heavily by SENATI's success.

THE SCHOOL OF TECHNOLOGY.[14] Mr. Robert Hemingway, UNESCO advisor to the Peruvian Ministry of Education on technical education, now working with Peru's new School of Technology, estimates that public secondary technical education in Peru suffers from a lack of facilities for apprenticeship training. Making a survey in September 1961 including some 110 firms with a mean of 260 employees each in the Lima-Callao area, Mr. Hemingway found a demand for high-level technicians among 57 respondents.[15]

These technicians are now being formed by training additional to that presently offered in the public secondary technical schools for men. The secondary schools prepare personnel at the level of skilled workers or low- to middle-level technicians. All technical training institutions in Peru, not at the secondary level, were aimed at producing professional engineers above the technician level. Therefore, until March 1964, when the School of Technology began operations, although there were about 50 public secondary technical schools for men in the nation, Peru had no institution designed to produce high-level technicians below the engineering level.[16]

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[13] In the August 1964 letter Dr. Romero reports that ten large firms have accepted SENATI's proposal to start units of instruction as part of their operations. These units would handle all on-the-job training for these firms with the help of 12 engineers and 28 instructors prepared by SENATI. The number of instructors is expected to double by December.

[14] Data in this section came primarily from Mr. Hemingway.

[15] This agrees with the author's findings (see Appendix E, Item 6).

[16] However, the Franco-Peruvian Technical Center was offering in-service training for foremen and technicians.

The School of Technology works in close cooperation with the National Engineering University and with the financial assistance of the U.N. Special Fund. In June 1964 there were 120 night students who were already employed in industry and 137 day students for whom jobs had not yet been found. When the program matures it would involve 900 students annually in a pre-engineering course (20 weeks) followed by a four-year program of alternated study and work.

To assure its students of the needed apprenticeship training, it employs the "sandwich"-type program alternating periods of work in industry (six or eight months each year) with periods of study at the school. These "work-based" students, already placed in industry, would assure the use of the skills developed by the training, an assurance which the public secondary technical schools do not have. "College-based" students (without job connections) are also admitted to the program, but jobs are immediately sought for them.

The School of Technology is located near the National Engineering University for several reasons. The National Engineering University is the principal supplier of graduate engineers for Peruvian industry (see Table 24). As such, the National Engineering University already has working relations with industry in the Lima-Callao area.[17] The university has new buildings on the outskirts of Lima with room for expansion. Also, at this location the facilities of the school will be available to students from the normal school 20 miles east of Lima at Chosica (Escuela Superior Guzman y Valle, "La Cantuta").

It was shown in discussing the follow-up study of the graduates of the public secondary technical schools for men that the salaries of these graduates are probably little better than the mean for all blue-collar workers employed in industry in the Lima-Callao area. That is, they probably earn about S/. 52 per day, S/. 1,560 ($58) monthly, or S/. 10,400 ($385) a year, assuming 200 working days in the year.

In a previous table (Table 36) we showed that the retention rate of public secondary technical schools for men was about 36% in the fourth year. In view of the fact that the tendency to drop out seems to decrease at the higher levels (pointed out in the discussion following Table 36), we might assume that the retention rate of the School of Technology would be higher than that of the secondary schools. Therefore, if we assume graduation of about 40% of the proposed 900 beginners, this would give us 360 graduates annually.

Hemingway estimates that these graduates will earn the same amount as engineers (S/. 6-7,000 monthly) since they will be doing essentially the same work.[18] We might reason that those students who apply for entrance to the School of Technology would be among the 3.6% of secondary technical school graduates who earn S/. 1,500 or more monthly after graduation (see Table 33). That is, they would earn more than the average blue-collar worker even if they were not to attend the School of Technology.

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[17] This was confirmed during interviews with employers (see Appendix E, Item 4).

Therefore, we might assume that they would earn, say, S/. 2,000 instead of the average (S/ 1,560). Then, taking the lower of Hemingway's estimates (S/. 6,000), we still find that the students, by graduating from the School of Technology, would earn three times more than they would otherwise. That is, after graduation they would earn an additional S/. 4,000 ($148) monthly, or an additional S/. 48,000 ($1,776) yearly. This would be a total incremental earning of S/. 17.3 million ($6.4 million) for all 360 students annually. Again, there would be a cumulative effect best shown by a table (Table 40).

TABLE 40

POSSIBLE ECONOMIC EFFECTS OF THE SCHOOL
OF TECHNOLOGY, 1963-73

	Effect on the Economy ($000,000)					
Graduating Class	Year after Graduation 1969	1970	1971	1972	1973	Total
1968	6.4	6.4	6.4	6.4	6.4	32.0
1969		6.4	6.4	6.4	6.4	25.6
1970			6.4	6.4	6.4	19.2
1971				6.4	6.4	12.8
1972					6.4	6.4
Total						96.0

Table 40 indicates an economic effect of $96 million in the ten-year period 1963-73. It should be noted that our table shows no effect whatever during the school's first four years of operation, 1964-68, while it is preparing its first graduates. The economic effects begin only in the year 1969, after the first graduates begin to work.

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[18] During the interviews with employers it was found that graduate engineers were being used as high-level technicians (see Appendix E, Item 6).

In the case of this program it is far clearer than in the case of the previous two programs that training programs do not yield their maximum effects unless continued for a number of years. However, more so than in the previous programs, the opportunity costs of attending the school must be considered. The student may not be able to afford the earnings foregone. For this reason, the longer the training program the more financial assistance to the student must be considered. In the case of the School of Technology this factor is reduced by the fact that the student is employed part-time by industry.

Of course, the above is a very crude measurement attempt with many variables held constant. Again, it could be argued that since this program would increase the number of high-level technicians available, it would reduce the salary offered. It can be replied, again, that this does not seem indicated in the immediate future, in view of the deficits of these workers. However, it does point up the need to expand existing firms or create new ones. Also, we should mention that, by upgrading the labor force, these new technicians would probably increase productivity in the industrial sector and thus shift all wage scales upward.

An important difference in the age of students between the School of Technology and the SENATI program should be pointed out. The average age of SENATI students is over 30 years, about twelve years older than the average School of Technology student. For this reason, the capitalization value of the training received by the School of Technology students would be higher.

THE GRADUATE SCHOOL OF BUSINESS ADMINISTRATION (ESAN).[19] The Graduate School of Business Administration (*Escuela de Administración de Negocios para Graduados*--ESAN) began operations in April 1964 for the express purpose of dealing with the shortage of entrepreneurs discussed earlier. Having the distinction of being Latin America's first full-time graduate school of business administration, ESAN was established by Stanford University's Graduate School of Business in cooperation with five Peruvian universities pursuant to a contract between the U.S. Agency for International Development (AID) and the Government of Peru.

It was noted earlier that 18% of the industrial labor force were recommended to be administrators and office workers (Table 21). In the Employment Service survey of industry (see discussion of Table 19) it was found that some 17.8% of a large sample of the industrial labor force were in this category. Therefore, the demand of employers (see Appendix E, Item 7) for personnel in this category is probably due to a shortage in quality rather than quantity.

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[19] Data in this chapter come from the association of the author with this project during its formative period and especially from Drs. Alan B. Coleman, ESAN's Director, and Robert R. Rehder, Professor, who provided the author every assistance.

Emphasizing quality rather than quantity, ESAN has begun operations with a small class of 50 students drawn from all areas of Peru and Latin America. This student body will be raised to 100 annually during the five-year period during which the initial staff of Stanford professors will be replaced by their Peruvian counterparts. The school has the cooperation of the University of San Marcos, Catholic University, the University of the Pacific, the Agricultural University, and the National Engineering University. Its board of directors includes people from business, industry, private and semi-private associations, and the universities.

ESAN is authorized to set its own requirements and choose its own students. Many come from business and industry. However, most come directly from the associated universities. When students are drawn from these universities, the degrees are awarded by the parent universities. However, ESAN has independent degree-granting privileges.

After an intensive eleven-month program, the participants are eligible for the degree of M.A. (Magister en Administración). By graduating 50 to 100 students per year, ESAN hopes to build up an elite cadre of professional business administrators with contacts all over Peru and Latin America. Presently, the program is highly regarded by large employers (see Appendix E, Item 7).

The income creation and distribution effect of a program of this type differ considerably from those of the previous programs considered. Here, the direct income creation and distribution effects are small. That is, the number of students involved when the program matures is only 100. Also, the difference in income (after training) may be smaller than in the other three programs. Certainly, it is much more difficult to calculate.

However, it is probably safe to say that students of this calibre would have earned high incomes even if they were not to attend ESAN. Asked what the salary range of students would have been if they were not to attend ESAN, the school's director could only cite the top salary previously received by one of the students, S/. 27,000 ($1,000) monthly. The least salary that any of the students would receive would probably be more than the mean salary of persons engaged in non-agricultural and non-mining activities in Peru in the period January-March 1963, or S/. 1,620 ($60) monthly.[20] Exactly how much more cannot be said at this time. A shrewd guess might be S/. 4-6,000 ($150-225) monthly.

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[20] Calculated from data on p. 11 of Ministerio de Trabajo y Asuntos Indígenas, Informe sobre la participación del Ministerio de Trabajo en el desarrollo económico y social del Perú (Lima, 1963).

At any rate, ESAN's director estimates the salaries of graduates to be anywhere from S/. 8,000 to S/. 30,000 monthly ($299-1,123 monthly or $3,588-13,476 yearly). This means that ESAN training may multiply the student's income by anywhere from 1.3 to 7.5 (130% to 750%).

This extreme range makes any calculation of the direct income effects of the program meaningless. Also, from the point of view of the assumptions of this study, the direct income accruing to the graduates of ESAN is not of primary interest to us for two reasons. First, there are too few students involved. Second, moving potentially highly paid personnel into still more highly paid positions would not effect the kind of income distribution of interest to us here. Therefore, we turn to the possible secondary income effects.

It is well known that a single entrepreneur may create jobs for thousands of workers. However, for purposes of illustration, assume that each ESAN graduate, through his entrepreneurial activities, creates as few as ten new positions after graduation. Assuming maturity of the program (100 students), this would be 1,000 new jobs annually. This would be only 0.8% of the 120,000 new urban jobs needed in the ten-year period 1963-73. However, if the program is allowed to continue for the five-year period 1964-69, it would begin to contribute 7.5% of the needed jobs as shown in Table 41.

TABLE 41

JOB-CREATING POSSIBILITIES OF ESAN, 1964-69

Graduating Class	Number of Jobs Created (000)					
	Year after Graduation					Total
	1965	1966	1967	1968	1969	
1964	1	1	1	1	1	5
1965		1	1	1	1	4
1966			1	1	1	3
1967				1	1	2
1968					1	1
Total						15

Table 41 indicates that 15,000 new jobs would be created during the period 1964-69. As previously mentioned this would be 7.5% of the annual requirement for urban jobs. Again, however, as in the other programs considered, it should be pointed out that no jobs whatever are created during 1964 before the first class graduates. Clearly, the program does not make its maximum contribution unless it is allowed to continue many years.

Although the income going to the graduates themselves is not of great importance in this study, the income going to their employees is of great interest. Some 40% of this income (see discussion of Table 16) is likely to be distributed to persons presently unemployed, underemployed, or employed at very low wages.

This discussion is meant to point out that the income distribution effect of a program such as ESAN depends, not upon the number of graduates it can place in existing industrial firms, but, rather, on the number of new industrial firms its graduates can create. An alternative to this last point would be: on the extent to which the graduates can expand existing firms.

This is pointed out because of the danger that existing firms may bid highly for the graduates of the ESAN program. It is true that there is a demand for managerial talent in existing firms (see Appendix E, Item 7). However, this should be resisted in favor of starting new firms.[21] In fact, by their efficient management of existing firms, ESAN graduates may actually reduce the number of jobs available. In one way this would be desirable because it would indicate an increase in productivity. However, it would increase the present level of unemployment, an effect which could be prevented by the establishment of new firms.

THE VEGA PLAN AND OTHER PROPOSALS.[22] It was found that only about 40% of the graduates of the public secondary technical schools for men find employment in existing industrial firms (see Table 32). The figure for the graduates of all public secondary technical schools (including women) may be as low as 11% (see Romero's estimate in the second chapter). Also, it has been pointed out that the principal reason for this is that there simply are not enough firms or jobs available in Peruvian industry to employ all those who seek positions.

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[21] Dr. Coleman is well aware of this problem and puts first priority on starting new firms. Professor Rehder, in informal interviews with students, found that in the first few months of the program one-third of the students already had plans to start firms of their own.

[22] Most of the data in this section come from interviews with Dr. Aristides Vega N. and conclusions drawn by the author from personal observations in Peru.

For this reason Vega proposes an increase in the number of self-employed public secondary technical school graduates.[23] It is recalled that some 9.6% of 523 such graduates graduating between the years 1950-58 did become self-employed (see Table 32). However, in view of the limited financial resources of these graduates (see Table 33) and the nature of their previous training, it can easily be understood why larger numbers could not accomplish this.

However, if self-employment could be increased, it would have a large income distribution effect for two reasons. First, these graduates otherwise would receive very low wages. Second, self-employment would entitle them to a larger share of any resulting income increase than would employment in existing industry.

Vega proposes a program at the post-secondary level to train graduates of the public secondary technical schools to set up one-man shops, home industries, and very small firms.[24] The faculty of this institution would act as business associates or industrial advisors to the students to assist them in securing all the necessary tools, equipment, credit, market research and other essentials. If necessary, these advisors would participate in the management of the enterprise until such time as it became a paying operation.

Once the enterprise started to function without assistance from the advisors, the student-industrialists would be called upon to reimburse the training institution for its assistance. This would mean that the proposed institution would have some of the features of the credit cooperative, calling upon the students and their parents to invest in its operations. Also, the institution would seek the cooperation of equipment importers, banks (such as the Industrial Bank), credit associations, research firms, and other interested parties.[25] The proposed institution, as we shall further discuss below, differs in significant details from ESAN. Its operation would have both large direct and indirect income creation and distribution effects. Also, it operates on an entirely different level. Although ESAN graduates may be interested in the establishment of such small enterprises, they would not typically be interested in performing the daily production operations involved. Chart 4 makes clear the position of the proposed institution in the existing chain of institutions designed to train people for the industrial development of Peru.

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[23] For a more complete description of this proposal see Aristides Vega N., La formación acelerada de pequeños empresarios, Ministerio de Educación Pública, Dirección de Educación Técnica y Desarrollo Artesanal, Lima, 1962.

[24] Dr. Staley (see Preface), author of a forthcoming book on the subject of small industry development (McGraw-Hill) and an international expert on the subject, conferred with Dr. Vega on this proposal. Dr. Vega had been thinking of the establishment of product-producing enterprises. Dr. Staley, on the other hand, pointed out that "modern artisan" activity (plumbing, installing equipment, electrical wiring, assembling prefabricated housing, custom sheet metal work), by offering a service rather than a product, needs little initial capital and does not compete with the large manufacturing firms. Recently, the firm with which Dr. Staley is associated completed an extensive study of the possibilities for artisan development in Ecuador. See Frank L. Turner, Donald G. Woodward, Edward A. Podesta, and Ramy Alexander, The Artisan Community in Ecuador's Modernizing Economy, A Report to the Government of Ecuador (Menlo Park, Calif.: Stanford Research Institute, November, 1963).

Chart 4 indicates that Peru lacks at least one of the links which would help for a more complete chain of institutions designed to produce the personnel needed for the industrial development of Peru. Some categories seem oversupplied. For example, too many institutions appear to be producing personnel as managers and office personnel for existing firms of all sizes. This would explain the relative abundance of this category in the present industrial labor force (17.8% out of a recommended 18%, see Table 21). On the other hand, complaints of employers about the quality of this level personnel (see Appendix E, Item 7) indicate a need for some kind of on-the-job training.

Most importantly, in view of the findings of the SRI team about the need for small industry development (see the second chapter), the other two indicated categories of administrative personnel seem slighted, especially the last category. Still another important feature of this proposal is the fact that it may help to provide employment for the proposed 8-10,000 graduates yearly of the Army's industrial training program. These graduates, without any training in business administration, would need persons trained in small industry development either to assist them to become self-employed or to employ them directly.

Prolongation of Education and Job-Splitting. It has been pointed out that difficulties can be anticipated in creating 120,000 new urban jobs

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[25] In June 1964 Dr. Vega was proposing a pilot project which, if successful, would provide the experience quickly to expand the program. Another proposal, then being drafted (by Joseph Stepanek and Richard Roberts of Stanford Research Institute), called for an industrial extension service to small industry. This last proposal might have a considerable income production and distribution effect since, although the small industrialists vastly outnumber the large industrialists in Peru, the product per worker in the smaller firms is much less than that of the larger firms.

CHART 4

MAIN INSTITUTIONS TRAINING PERSONNEL FOR THE INDUSTRIAL DEVELOPMENT OF PERU

	Training Institutions	
Personnel Needed	**Pre-Job**	**On-the-Job**
Technical:		
Engineers	**UNI,* SM**	**Large private firms**
Technicians	**School of Technology**	**SENATI, CTFP, School of Technology, large private firms**
Qualified workers	**Secondary technical schools, Army industrial training program**	**SENATI, private firms**
Administrative:		
Executives and entrepreneurs for large firms	**ESAN**	**IPAE**
Managers and office personnel for firms of all sizes	**ESAN, SM, UC, UP, UL, ISCOP**	
Manager-technicians for small enterprises		

***Key to abbreviations as they appear in the chart:**
UNI--Universidad Nacional de Ingenieria (National Engineering University)
SM--Universidad de San Marcos (University of San Marcos)
SENATI--Servicio Nacional de Aprendizaje y Trabajo Industrial (National Apprenticeship and Industrial Labor Service)
CTFP--Centro Técnico Franco-Peruano (Franco-Peruvian Technical Center)
ESAN--Escuela de Administración de Negocios para Graduados (Graduate School of Business Administration)
IPAE--Instituto Peruano de Administración de Empresas (Peruvian Institute of Business Administration)
UC--Universidad Católica (Catholic University)
UP--Universidad del Pacífico (University of the Pacific)
UL--Universidad de Lima (University of Lima)
ISCOP--Instituto Superior de Comercio del Perú (Peruvian Higher Institute of Commerce)

annually in Peru and that this might call for some rather unconventional proposals. Some of these have already been discussed. Another calls for approaching the problem somewhat differently.

Instead of creating new jobs, it may be feasible to reduce the number of jobs demanded. This can be done by prolonging the education of students presently attending school. This would keep a certain number of students off the labor market. The Ministry of Labor estimates that this number would be 23,000 during the ten-year period 1963-73 (see Table 3). There is no reason why this number could not be increased. To do this would require that students presently attending school, or planning to attend, be given financial assistance to reduce the high dropout rate (see Table 36). It could also be done by increasing opportunities for the graduates of the public secondary technical schools to continue their studies past the secondary level. This opportunity could be afforded by institutions such as the School of Technology or by converting some of the many public secondary technical schools, now all at the secondary level, into post-secondary institutions.

Another way of reducing the employment problem is by the use of "job-splitting." This would call for part-time employment of presently unemployed persons on the condition that the rest of their time be spent in training in an institution such as SENATI. For example, General Motors plans to begin assembling automobiles in the immediate future in Lima. This would call for an expansion of its present plant from 200 to 700 workers (see Appendix C), or an additional 500 workers. If two workers, instead of one, were hired for each position available (each on a part-time basis), this would mean GM could hire 1,000 workers instead of 500.[26]

Of course, this plan has several variations. Some, rather than all, new employees could participate. Part-time work could be offered to the younger of presently employed workers (those without family responsibilities). These younger workers might be willing to accept a reduction in pay if attractive training opportunities were offered to them. The SENATI program is similar to this scheme, but is largely outside of working hours.

In the case of half-time employees, the worker could either receive half pay, or perhaps three-quarters pay. The additional amount might be paid by the employer, who stands to benefit in the long run, or by the state, which also stands to benefit.

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[26] Asked to comment on this proposal, the managing director of the Lima GM plant said he thought it would not work unless adopted by several companies at once. The firm's personnel director was not unfavorable to the idea but reserved opinion.

At any rate, the program would have two objectives. First, it would expand employment opportunities by withdrawing some workers from the labor force. Second, it would eventually upgrade the labor force by improving the skills of workers. This upgrading of skills would undoubtedly increase productivity and hence incomes. The income distribution effect of the program could be maximized by selecting the participants from among those presently unemployed, underemployed, or employed at very low wages.

An Institution to Train Illiterates. Another partial solution to Peru's employment problems needs further study but can be indicated by Chart 5. Roughly, this chart is designed to point out that, presently, Peru does not have a well-developed program to incorporate unemployed adult illiterates (not members of the Armed Forces) into the industrial economy. Also, since SENATI, by law, deals only with firms of over twenty workers, there is no program for workers in the smaller firms.

CHART 5

PERSONNEL AVAILABLE FOR THE INDUSTRIAL DEVELOPMENT OF PERU

Personnel	Training Institution(s)
Unemployed adult illiterates (not members of the Armed Forces)	
Graduates of primary schools	Secondary technical and general schools
Graduates of secondary schools	School of Technology, CTFP, UC, UP, UL, ISCOP*
University graduates	ESAN, SM
Employed workers in large firms	SENATI, CTFP
Employed workers in small firms	

*For key to abbreviations see Chart 4, p. 82.

CONCLUSIONS OF THE STUDY--The Problem Restated. The problem of this study of education and nation building was to determine educational policies and programs which would be instrumental in achieving both an increase and a better distribution of income in the industrial sector (Peruvian national goals).

The Method Used. It became evident early in this study that appropriate statistics on education, income, and employment would not be readily obtainable. Hence, it was necessary to make inferential use of such data as were available and to supplement these by gathering some primary statistics from what appeared to be relevant sample groups. These included a selected sample of: (1) the largest employers, (2) technical school directors, and (3) educational experts.

The first sample included nineteen of the largest employers, employing one-third of the workers engaged in manufacturing firms registered with the Ministry of Development or one-eighth of the workers engaged in all the manufacturing firms of the nation. The second sample included all of the directors of technical schools for men in the Lima-Callao area or one-fourth of all such directors in the nation. The third sample included fourteen educational experts drawn from nine major national and international institutions concerned with education in Peru.

An appropriate questionnaire concerning education, income and employment was devised and administered by interview to each group (Appendices A, E, F, G). During the process a tour was made of some of the larger industrial firms in four urban areas of Peru (Lima-Callao, Arequipa, Puno, Cuzco) and of all the vocational-technical school facilities for men in the Lima-Callao area.

Some appropriate data were gathered to supplement those available from official sources. These data provided a background from which to evaluate five specific educational programs and their policies:

1. The public and private secondary technical schools for men,

2. The Army's industrial training program,

3. The National Apprenticeship and Industrial Labor Service (SENATI),

4. The School of Technology, and

5. The Graduate School of Business Administration (ESAN).

In addition, several proposals were considered. They included the Vega Plan to train small industrialists and several schemes either to increase the number of jobs available or decrease the number of jobs needed.

Findings. It was found that only a small percentage of students who study industrial subjects find jobs in industry (10-40%, depending on the level and type of education). In order of importance the reasons appear to be essentially three: First, there simply are not enough positions available in existing firms. Second, the level and type of training offered by most of the institutions is inappropriate for employment in these firms. Third, the attitudes of both educators and students appear to be either ambivalent or unfavorable toward industrial employment.

Employment. Restating the employment situation, it was found that the Ministry of Labor, assuming a 5% under- and unemployment level (combined), estimated that 1.2 million jobs would be needed in the period 1963-73 to absorb demographic growth in the labor force and to reduce under- and unemployment to the "frictional" level (2%, see Table 3). However, accepting the more realistic figure of 20% presently under- and unemployed (combined), we arrived at the figure of 1.8 million jobs needed during that same ten-year period (see Table 4). The first estimate would call for 120,000 new jobs annually; the second would call for 176,000.

Accepting the figures of Vinogradoff, we concluded that 120,000 of these 176,000 jobs needed annually would have to be in urban areas and the remaining 56,000 in rural areas (see Table 6). Of the 120,000 urban jobs, we concluded (accepting the 1:2 ratio used by Vinogradoff) that 40,000 would have to be in industry and 80,000 in supporting activities.

We found that, if we could optimistically assume that a 6% growth rate in gross national product would generate 20,000 new industrial jobs annually (which in turn would generate 40,000 new jobs in supporting activities for a total of 60,000 jobs altogether), this would still leave a deficit of 60,000 urban jobs annually (accepting 120,000 as the needed number). Translated into terms more easily understood, this annual deficit of 60,000 urban jobs means several applicants for every industrial job.

This brings us to the most essential finding of this study; namely, that the main reason why industrial education in Peru is not having the desired (and expected) effects on income size and distribution is simply because the recipients of such training are not able to find employment which utilizes their newly acquired skills. In fact, it would seem that further production of such manpower, without concomitant measures to expand job opportunities, would merely (by the law of supply and demand) reduce their per capita wages.

There are several reasons for the limited number of industrial positions. Chief among them is the shortage of willing and able entrepreneurs (see second chapter, section on "The Shortage of Industrial Jobs"). A close contender is the legislative restrictions placed on the expansion possibilities of large firms (see discussion concerning Table 29).

Mismatching Study with Work. Closely allied to the failure of many students to find work is the fact that nearly all the secondary technical schools of Peru teach the same (unneeded) skills (see Table 25). Hence, many students leave such schools without either a marketable skill or a good general education (thought by some employers to be more important than specialized training, see Appendix E). Therefore, some of the students now attending these secondary technical schools might be transferred to secondary general schools. An alternative to this might be to convert some of these secondary technical schools into secondary general schools. At any rate, it seems essential that the training offered in the secondary technical schools be upgraded and made more relevant to industry. Certainly, one approach that is wisely being taken is to provide post-secondary technical education (such as that offered in the School of Technology).

Allied to this is the suggestion that technical training institutions be reduced in number but increased in quality. That is, the faculty should itself have industrial experience; the administration should have adequate equipment and sufficient funds for maintenance and purchase of materials. In this way, the cost per graduate may actually be reduced by preventing losses due to dropout. Other measures to reduce losses due to dropout seem needed. Since technically trained personnel have a high productive capacity in any society, scholarships and loans to students pursuing this kind of education seem justified. Certainly, better occupational guidance than that presently being offered would be a very minimum.

Unfavorable Attitudes toward Industrial Employment. It was found that, although the technical school directors expressed favorable attitudes toward industrial employment for their students, they often behaved in a manner that would appear to be contradictory. For example, these directors all professed a strong belief in the value of technical education. Yet the portraits hung on the walls of the technical schools to inspire the students were those of non-technical culture heroes. All these school directors professed a strong desire that their students should obtain jobs in industry, yet few had made any studies to discover whether or not their students were successful in obtaining such employment.

In a previous study it was found that a significant number of students preferred to be white-collar workers, even if offered considerably more money to be blue-collar workers. Hence, it is probably true that many students have an unfavorable attitude toward industrial employment. However, the fact that there are so many applicants for every industrial job speaks for itself. For this reason, although unfavorable attitudes are certainly important, the large majority of students do not obtain industrial jobs for other reasons. In order of importance, the two most outstanding reasons are that such jobs are not available or the student's training for the job is inadequate.

Designing Better Institutions. Several programs and policies were explored. Basically, it was found that those programs which are most likely to have a maximum effect on income size and distribution in the industrial sector are those which raise the training level and employment opportunities of those who are presently unemployed, underemployed, or employed at very low wages. We suggested that certain investments in either physical improvements or human resources may tend to skew further the present income distribution without significantly raising the incomes of poorly paid groups.

Some programs, such as the Army's industrial training program, the National Apprenticeship and Industrial Labor Service (SENATI), and the Vega Plan, can accomplish desirable results directly, by training workers who otherwise would be poorly paid. Other programs, such as the Graduate School of Business Administration (ESAN) can accomplish results indirectly by training persons who will employ others.

In all cases, it was pointed out that educational and training programs need a long lead time in order to realize their maximum effect on the economy. For this reason, in order to give these programs the necessary continuity and stability, it is necessary to protect them from political fluctuations. This calls for experimentation with a variety of institutional designs. Such experimentation should continue at least until more continuity and stability is characteristic of the public sector of education.

We pointed out, also, in view of the high prospective demand for jobs, that certain unconventional plans be considered. These include reducing the demand for jobs by prolonging education for some segments of the population, spreading existing employment by withdrawing employed workers from the labor force (while they receive additional training), and offering to others part-time work combined with study.

We suggested also, without detailed examination, that Peru may be lacking some of the links which would form a more complete chain of institutions preparing personnel for industrial development. For example, the Vega Plan seems recommended on the basis of the fact that no institutions are presently training people to establish and operate industries. Examining the personnel available for industrial development, some institution seems necessary to train and assist unemployed illiterates to secure industrial positions. Often employers screen out these jobseekers by listing vacancies in the newspapers.

Chart 6 attempts to summarize the recommendations in this study and indicate the institutions which might implement these recommendations. Charted in this way, it can be seen that the several recommendations fall under four responsible ministries of equal power. Therefore, it would seem necessary to have some coordinating body for the total program.[27] Presently, this function would seem to fall within the area of responsibility of the National Planning Institute. The central position of the National Planning Institute can be seen in Figure 3 (see also supra, p. 14, footnote 27).

CHART 6

SUMMARY OF RECOMMENDATIONS

Recommendation	Implementing Proposal or Institution	Responsible Ministry
1. Increase the number of jobs available by:		
a. changing social legislation so as to allow existing firms to expand,		Labor
b. establishing institutions to train entrepreneurs,	ESAN, Vega Plan	Education Development
c. withdrawing workers from the labor force for training purposes,	SENATI	Labor Education
d. giving tools and technical advice to craftsmen interested in self-employment, and	Army industrial training program	War Labor
e. expanding available placement services.	SERH	Labor
2. Decrease the number of jobs demanded by:		
a. reducing school dropout at the secondary level, and	Scholarships and loans to secondary school students and better occupational guidance	Education Labor

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[27] Dr. Carlos Cueto Fernandini, Director of the National Library, recommended a National Council for Technical Education. Dr. Cueto Fernandini was strongly recommended in 1963 for the position of Minister of Education.

CHART 6--Continued

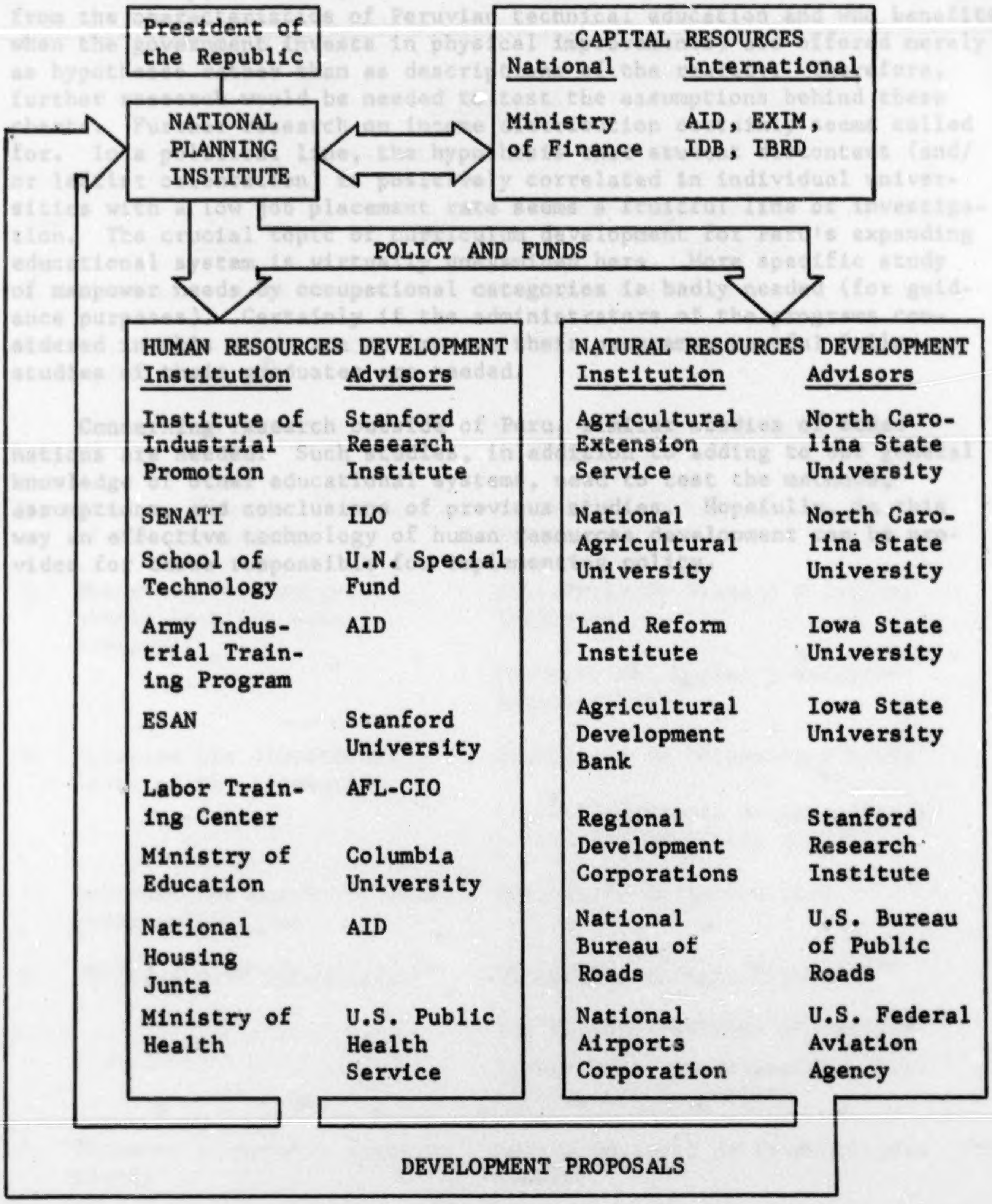
Recommendation	Implementing Proposal or Institution	Responsible Ministry
b. increasing opportunities at the post-secondary level.	School of Technology	Education
3. Reduce the number but increase the quality and differentiation of technical training institutions.	School of Technology	
4. Create a method for employed personnel to improve their skills.	SENATI	Labor Education
5. Create an institution for unemployed illiterates to receive occupational training and job placement.	SERH	Labor
6. Empower a permanent semi-private body to coordinate and oversee the chain of institutions training personnel for industrial development.	National Planning Institute	

Key to abbreviations:

ESAN--Escuela de Administración de Negocios para Graduados (Graduate School of Business Administration)
SENATI--Servicio Nacional de Aprendizaje y Trabajo Industrial (National Apprenticeship and Industrial Labor Service)
SERH--Servicio del Empleo y Recursos Humanos (Employment and Human Resources Service)

Suggestions for Further Research. It was pointed out in the Preface and again in this concluding section that appropriate statistics of a comprehensive nature were not available in Peru. Hence, highly inferential use was made of such data as were available. Therefore, Chart 6 might more appropriately be considered a list of suggestions for further research rather than a set of recommendations.

However, in subjecting these recommendations to further study, it should be recalled that they were specifically designed to implement policy stated in the Charter of the Alliance for Progress (Title I, Sections 1 and 2, concerning raising per capita income and distributing income more equitably). The effectiveness of these recommendations in achieving these policy objectives should be the criterion of judgment.


President of the Republic
NATIONAL PLANNING INSTITUTE
CAPITAL RESOURCES
National
International
Ministry of Finance
AID, EXIM, IDB, IBRD
POLICY AND FUNDS
HUMAN RESOURCES DEVELOPMENT
NATURAL RESOURCES DEVELOPMENT
DEVELOPMENT PROPOSALS

HUMAN RESOURCES DEVELOPMENT

Institution	Advisors
Institute of Industrial Promotion	Stanford Research Institute
SENATI	ILO
School of Technology	U.N. Special Fund
Army Industrial Training Program	AID
ESAN	Stanford University
Labor Training Center	AFL-CIO
Ministry of Education	Columbia University
National Housing Junta	AID
Ministry of Health	U.S. Public Health Service

NATURAL RESOURCES DEVELOPMENT

Institution	Advisors
Agricultural Extension Service	North Carolina State University
National Agricultural University	North Carolina State University
Land Reform Institute	Iowa State University
Agricultural Development Bank	Iowa State University
Regional Development Corporations	Stanford Research Institute
National Bureau of Roads	U.S. Bureau of Public Roads
National Airports Corporation	U.S. Federal Aviation Agency

FIGURE 3

FUNCTION OF THE PERUVIAN NATIONAL PLANNING INSTITUTE
EMPHASIZING THE MANAGEMENT OF FOREIGN ASSISTANCE
Source: Adapted from material
provided by the USAID-Peru

Certainly, Charts 1, 2, and 3 of this study (concerning who benefits from the characteristics of Peruvian technical education and who benefits when the government invests in physical improvements) are offered merely as hypotheses rather than as descriptions of the reality. Therefore, further research would be needed to test the assumptions behind these charts. Further research on income distribution certainly seems called for. In a political line, the hypothesis that student discontent (and/or leftist orientation) is positively correlated in individual universities with a low job placement rate seems a fruitful line of investigation. The crucial topic of curriculum development for Peru's expanding educational system is virtually unexamined here. More specific study of manpower needs by occupational categories is badly needed (for guidance purposes). Certainly if the administrators of the programs considered in this study are to improve their programs, careful follow-up studies of their graduates are needed.

Concerning research outside of Peru, similar studies of other nations are needed. Such studies, in addition to adding to our general knowledge of other educational systems, need to test the methods, assumptions, and conclusions of previous studies. Hopefully, in this way an effective technology of human resources development can be provided for those responsible for implementing policy.

APPENDIX A

NATIONAL GOALS OF PERU[1]

Goal	Institution Working to Achieve the Goal
1. Raise per capita income	Alliance for Progress
2. Distribute income more equitably	Alliance for Progress
3. Reform land tenure	Comision de Reforma Agraria, Camera de Diputados
4. Increase the level of health of the population	Ministerio de Bienestar y Salud Pública
5. Integrate the indigenous people into the national economy	Ministerio de Trabajo y Asuntos Indígenas Servicio del Empleo y Recursos Humanos (SERH)
6. Increase the educational level of the population	Ministerio de Educación Pública Servicio Nacional de Aprendizaje y Trabajo Industrial (SENATI)
7. Increase the amount of land under cultivation	Ministerio de Agricultura
8. Increase farm productivity	Ministerio de Agricultura Universidad Nacional de Agraria Servicio de Investigación y Promoción Agraria (SCIPA)
9. Increase industrial productivity	Centro Nacional de Productividad (CENIP)

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[1] Not exhaustive, this list merely represents a screening of Lima's largest dailies (El Comercio and La Prensa) during the ten-month period August 1963 to June 1964.

Goal	Institution Working to Achieve the Goal
	Servicio Nacional de Aprendizaje y Trabajo Industrial (SENATI)
	Agency for International Development-Stanford Research Institute
	Instituto Nacional de Promoción Industrial (INPI)
	Instituto Peruano de Administración de Empresas (IPAE)
	Sociedad Nacional de Industrias
	Corporacion Nacional de Comerciantes (CONACO)
	Federación Nacional de Pequeños Comerciantes e Industriales del Perú (FENACOI)
10. Increase the number of jobs available	Ministerio de Trabajo y Asuntos Indígenas
	Servicio del Empleo y Recursos Humanos (SERH)
11. Decentralize industry[2]	Ministerio de Desarrollo y Obras Públicas
12. Develop an internal market for manufactured goods	Ministerio de Hacienda
13. Reduce imports	Ministerio de Hacienda
14. Reduce migration into urban areas	Ministerio de Trabajo y Asuntos Indígenas
15. Increase the number of industrial firms	See Goal 9
16. Replace foreign personnel with nationals[3]	Ministerio de Hacienda

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[2] Industrial Promotion Law 13270 (1959) establishes exemptions favoring investment in the Jungle, Sierra, and Coast, in that order (Section 9, Articles 30 to 57).

[3] Presently, the law requires that only 20% of the personnel of a firm can be foreigners.

APPENDIX B

EDUCATIONAL INSTITUTIONS INCLUDED IN THE SAMPLE AND NUMBER OF STUDENTS ENROLLED, 1963-64

Institution	Enrollment
Public:	
Politécnico Nacional "José Pardo"	452
Escuela Técnica de Electrónica	239
Instituto Nacional de Educación Industrial	
No. 1 "Estados Unidos"	843
No. 16 "Canadá"	390
No. 17 "Dos de Mayo"	300
No. 24 "Ricardo Palma"	524
No. 25 "Meliton Carvajal"	973
No. 28 "Manuel A. Villavicencio"	617
Private:	
Colegio Industrial "Nuestra Señora de la Paz"	325
Centro Técnico Franco-Peruano	500
Instituto Industrial del Colegio "Salesiano"	248
Escuelas Técnicas "Gamor"	1,400
Instituto "Metropolitano"	400
Total	7,211[a]

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[a] This total (7,211) represents about 16% of the figure (42,978) reported as being the total number of all students enrolled in public and private secondary technical schools in Peru in 1961 (see p. 48, footnote 14).

APPENDIX C

FIRMS INCLUDED IN THE SAMPLE OF PERU'S LARGEST EMPLOYERS AND THE NUMBER OF WORKERS EMPLOYED

Firm	Number of Workers
Anderson, Clayton & Company	1,000
Compania Oleaginosa del Peru, S.A. (COPSA)	620
Backus & Johnson	1,415
Cerro de Pasco	14,000
Coca-Cola (independent bottlers)	300[a]
Goodyear	661
D'Onofrio	1,000
Empresa Pesquera, Ilo	2,000
Enrique Feyerros	750
General Motors	200[b]
Goodrich	315
Grace & Company (including affiliates)	10,851
Industria Reunidas, S.A. (INRESA)	570[c]
International Petroleum Company	5,168
Leche Gloria	700
Marcona Mining Company	2,167
Peruvian Corporation	6,000
Sears Roebuck & Company	652
Southern Peru Copper Corporation	4,000
Total	52,369[d]

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a. Author's own estimate.

b. Proposed: 700.

c. Expansion proposed.

d. This figure represents about one-third of all workers employed in registered manufacturing firms in the nation or one-eighth of those employed in all manufacturing firms.

APPENDIX D

INSTITUTIONS REPRESENTED IN THE SAMPLE OF EDUCATIONAL EXPERTS[a]

Institution	Position(s) of Expert(s)
Escuela de Administración de Negocios para Graduados (ESAN)	Director
Centro Militar Industrial del Perú	Advisor (USAID)
Servicio del Empleo y Recursos Humanos (SERH)	Director Assistant Director
United States Agency for International Development (AID)	Chief, Manpower Division
International Labor Office (Lima)	Regional Manpower Expert
United Nations Special Fund	Advisor to the Minister of Education
National Library	Director
National Planning Institute	Educational Programmer U.N. Advisor on Educational Planning
Teachers College, Columbia University	Advisors to the Minister of Education

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[a] This list represents nine key institutions and fourteen individuals. In addition, assistance was received from a number of experts not included in the sample (see Appendix H).

APPENDIX E

RESULTS OF QUESTIONNAIRE (ON TRAINING PROBLEMS OF EMPLOYERS) ADMINISTERED MAY 1964 TO NINETEEN OF THE LARGEST EMPLOYERS IN PERU

1. Does your firm have its own training program?[1]

   Eleven said yes and 1 no. Of 4 employers volunteering the percentage of workers involved, 2 said 100%, 1 said 60-100%, and 1 specified 60% of white-collar workers. One employer specified that 100% of employees were involved in a safety course. Four employers specified that they have no formal training system. One firm sends 2 men every 2 years to Great Britain for training in special technology, while another sends key men to the United States. Another firm has an arrangement with a local correspondence school for the training of personnel. The impression gained was that private firms are not as active in training activities as in the United States.[2] However, pressure to replace foreign personnel with nationals has increased such activity (see National Goal 16, Appendix A).

2. If a worker improves his skills or increases his educational level, will he make more money in your firm?

   All respondents replied yes. However, using such phrases as "not necessarily, not automatically, providing . . . ," 6 employers qualified their positive response by pointing out that a better-paying position must be available within the firm. Two employers pointed out that there might be resistance on the part of the union if seniority rights were involved. The impression gained was that there are very few positions opening up at higher-paying levels, but that employers are quite willing to advance qualified personnel when such positions become available.

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[1] The answer to some questions may not appear to account for all the respondents in the sample. When this occurs it is because of the fact that some respondents declined to respond to this question as it was phrased; rather, they offered a qualified response. In other cases the response may seem to indicate more respondents than were included in the sample. The reason for this is simply that in the original questionnaire each question was followed by several suggested responses (omitted here for brevity) and some respondents chose more than one response.

[2] See Harold F. Clark and Harold S. Sloan, Classrooms in the Factories (Rutherford, N.J.: Institute of Research, Fairleigh Dickinson University, 1958).

3. Do you want your employees to receive detailed pre-employment training in the work of your firm?

   Five said yes and 10 no. There was doubt among the 5 that said yes as to whether or not detailed pre-employment training were available in the work of their firm. Some employers stated that pre-employment training is necessary for some workers (mechanics, typists), but not for others (laborers). Most employers felt that the work of their firm was so specialized that some on-the-job training would be necessary regardless of the amount of pre-employment training received. The impression gained was a preference for a better quality of general education (for most workers).

4. How well are the technical education institutions preparing personnel to work in your firm?

   Five employers stated flatly that neither the public nor the private technical institutions are making a significant contribution to the training efforts of their firm. The Lima and Callao commercial high schools, the Salesiano technical school, and the Estados Unidos public secondary technical school (see Appendix B) were cited by different employers as outstanding. Seven employers mentioned the National Engineering University as outstanding. Some employers claimed that they hire only university-level technical personnel. One employer stated that the program at the Politécnico Nacional "José Pardo" (see Appendix B) changed too often to be effective. The general impression gained was that technical education at the secondary level was not highly regarded by the employers.

5. What is your opinion of the Servicio Nacional de Aprendizaje y Trabajo Industrial (SENATI)?

   One employer stated that SENATI should concentrate on general education, leaving specific training to the firm. Another stated that SENATI is an addition to the high fixed cost of operation (see Table 29 in the text) without increasing profits. Three employers stated that the operations of their firm are too far away to be affected by the program (at that time SENATI was operating only in Lima-Callao). Three employers stated that the program does not affect their firm. Seven employers stated that the program was a good idea, but that more time was needed for results. One employer stated that the training program of his firm would have to be continued even after SENATI gains momentum. The general impression gained was one of qualified support for SENATI.

6. What is your opinion of a four-year alternating work-study ("sandwich") program after secondary school to prepare high-level technicians (below the engineering level)? (A reference to the School of Technology, see third chapter.)

Seven employers said this type of program is an improvement over the purely theoretical training received in the secondary technical institutions. Eight said they were interested in hiring the graduates of such a school. None said they would not hire these graduates, although one employer said his firm was not presently hiring personnel at this level. One employer said that his firm has to do its own training at this level. Four employers stated that such a program would be disruptive of their firms' operations. Generally, there seemed to be support for the program and a demand for high-level technicians. Presently, the firms are using highly paid graduate engineers in these posts.

7. What is your opinion of a graduate school to train high-level management personnel? (Designed to elicit an opinion on ESAN)

Twelve employers stated that the program would fill a gap in the Peruvian educational system. Four employers stated that their personnel is highly stable and therefore they are not hiring at this level. On the other hand, 5 employers said that they were seeking such personnel. Nine employers stated that they could not release a man for full-time training but that they would welcome part-time training. Generally, there seemed to be familiarity with, and support for, the ESAN program.

8. Do representatives from your firm ever visit educational institutions to recruit personnel?

Five employers said yes and 13 no. Of those who said yes, 4 said they visit the National Engineering University, but not the secondary schools. Two firms mentioned that they recruit personnel by advertising in the newspapers. One firm mentioned that they have an excess of general workers but have been trying for 6 months to find 2 qualified accountants. The general impression gained was that employers rarely need to recruit personnel. When such recruitment is necessary, employers seek personnel only at the university level.

9. Do educational authorities ever contact you about job opportunities?

Thirteen employers said no. Six employers said educational authorities (university level) contact them to place students for summer apprenticeship training, but not for permanent placement. There was no mention of any contacts from secondary technical school directors.[3] Generally, the impression gained was one of limited contact between educators and employers.

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[3] This seems to contradict the claim of the school directors that they do contact employers (see Appendix G, Item 5). A possible explanation for this is that the school directors contact the smaller employers, rather than the larger ones reported on here.

10. What is your opinion of the Army training recruits in a trade in the last 3 months of their recruitment?

Ten employers said that the Army program fills an important need for skilled workers in Peru. Nine said it represents an upgrading of the group from which their firm selects personnel. Five said the program does not directly affect their firm. Those who said the program does not affect their firm explained that their needs are for personnel above the craft level. One firm said they use ex-Army men, but only those with more advanced skills (after 7 years of service). Another employer claimed that his firm's personnel is too stable to need additions. Generally, there seemed to be support for the program but doubt that the level of training would be appropriate to industrial needs.

11. What is the ideal pre-employment and on-the-job training program for workers in your firm?

Thirteen employers indicated a preference for a good general education (as distinct from detailed pre-employment training). Six indicated a preference for a good general education combined with training in the SENATI program. Eight preferred a good general education and SENATI training plus company training. Four preferred all of the previous types of training plus detailed theoretical pre-employment training for engineers and management personnel.[4] The general impression gained was that the employers seek employees who have a good background for further training, rather than narrowly (perhaps poorly) trained specialists.

12. What is your reaction to the following statements? (Strongly agree, agree, undecided, disagree, strongly disagree)[5]

a. The high fixed cost of fringe benefits cuts down on the amount employers spend for worker training and education.

Nine employers strongly agreed, 3 agreed, 1 was undecided, 1 strongly disagreed. One employer said there was no way to measure this effect. Another stated that his firm would have to continue its training operations regardless of the high fixed costs of fringe benefits. Another stated that, in fact, such costs may be inversely related. That is, a firm may increase its training operations in order to eliminate (inefficient) personnel and thus reduce its fringe benefit expenses. One employer stated that, in the case of his firm, such benefits were over 100% of base pay. The general impression gained was that, although lower costs for fringe benefits might free funds for training purposes, there was no necessary connection between fringe benefit costs and training costs.

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[4] This contrasts with the response of the school directors who felt that detailed technical pre-employment and apprenticeship training was the ideal (see Appendix G, Item 9).

[5] Because of fixing 5 categories of response the reporting of the answers is abbreviated here. For example, if all respondents chose the first response, then the response to the remaining four categories (to save space) would not be reported. See also footnote 1.

b. The difficulty of laying off workers prevents employers from hiring additional workers when needed.

Eleven employers strongly agreed, 6 agreed, 1 strongly disagreed. One employer said that his firm avoids the lay-off problem by arranging with a contractor to do unforeseen work (like construction). Another employer claimed that Peruvian labor laws are so "advanced" that they "hurt the workers" (by preventing employers from adding personnel during boom periods for fear of being "stuck" with them during slump periods). Another employer confided that over 1,000 of the workers in his firm are temporary. The firm intends to fire these workers (within 90 days) before they are eligible to join the union. Still another employer confided that his firm is forced to discharge a worker before he completes 35 years of service in order to avoid the stiff pension obligations. The general impression gained is that the difficulty of laying off workers (plus the heavy legal obligations of employers to their workers) retards job expansion.

c. The low educational level of job applicants prevents employers from hiring personnel when needed.

One employer strongly agreed, 8 agreed, 1 was undecided, 7 disagreed, and 2 strongly disagreed. Of those who agreed, 1 employer stated flatly that his firm does not hire illiterates. Another said that educational level is particularly important in the case of office workers and technicians. Of those who disagreed, 3 employers said that, when needed, they hire workers regardless of educational level (and the firm trains them). The general impression gained was that educational level is not as important a factor in the need for personnel as is an expansion in the demand for the products (or services) of the firm.

d. Vocational guidance should be based equally on job opportunities and the student's personal preferences and abilities.

Five strongly agreed, 13 agreed, 1 was undecided. One employer remarked that guidance procedures in Peru are very poor. Although the response was clearly positive, it seems that this statement held very little meaning for employers.

e. The school should teach the technology which would increase the student's productivity as a worker.

Eight employers strongly agreed, 7 agreed, 3 disagreed. One employer stated that the school would not have time to teach specific technology. He added that he felt the present graduates were not sufficiently prepared in fundamental subjects. Another employer said that he felt the role of the school should be broader. Generally, it was felt that the school should provide the kind of training (academic) not available elsewhere.

f. Educational authorities should consult regularly with employers.

Ten employers strongly agreed, 7 agreed, 1 was undecided. One employer stated that there should be a reciprocal relationship. Another saw a need for some kind of institutionalized contact. Generally, there was positive response.

g. All educational institutions should operate a service to assist their graduates in finding suitable employment.

Thirteen strongly agreed, 6 agreed. One employer questioned the practicality of this in Peru. He explained that the Peruvian applicant feels that to secure a position some kind of "pull" or "lever" is needed. Even applicants for relatively minor positions often come with recommendations (some from top officials in the government). Generally, there was positive response.

h. School authorities should dignify manual work and make information about employment opportunities in this field readily available.

Ten strongly agreed, 9 agreed. Two employers stated that too many young men want to become lawyers. Another employer stated that there is little pride in manual work. A Peruvian father does not want to pass his trade on to his son. Rather, he wants him to become a "professional" (lawyer).

i. An educational system should allow a student of any age or previous experience to learn a marketable skill.

Six strongly agreed, 11 agreed, 1 was undecided, 1 disagreed. Two employers stated that some groups may not be worth retraining ("The old people are a loss in Peru"). Most employers responded positively.

j. The school should concern itself equally with academic and vocational training.

k. A single training period previous to entering an occupation is sufficient for a working lifetime.

One employer was undecided, 12 disagreed, 6 strongly disagreed. One employer stated that this would depend on how long and how thorough was the initial period of training. Generally, the employers felt that the workers would need "continual training" throughout their working lives.

13. Additional comments:

Regarding labor legislation, one employer stated that giving a raise is unnecessarily costly to the employer because of the retroactive effect on the employee's severance pay. With regard to fringe benefits, this same employer stated that much of these "benefits" are illusory because of the effect on inflation. With regard to advancement opportunities, one employer said that union insistence on seniority rights reduces the incentive for "bright young men" to improve themselves educationally.

One employer stated that many of the excess personnel of his firm were untrained (some of them agitators). Another testified to "an attitude of class conflict" which masks the fact that the workers are not really trying to increase production or make their firm more successful. This same employer stated that it is virtually impossible to fire a man for laziness. There is no incentive for a man to give an "honest day's work" for a day's pay. On the contrary, social legislation protects the incompetent and lazy. Often labor leaders sent to the United States or Great Britain for training lose power when they return. Other laborites claim they have "sold out" to the capitalists.

Another employer testified that a business career is a "last choice" in Peru. There is little incentive to go into business because it is family-controlled or controlled by large corporate (usually foreign) interests.

APPENDIX F

RESULTS OF QUESTIONNAIRE (ON THE CONTRIBUTION OF EDUCATION TO INDUSTRIALIZATION) ADMINISTERED MAY 1964 TO FOURTEEN EDUCATIONAL EXPERTS IN LIMA, PERU

1. What is your reaction to the following statements? (Strongly agree, agree, undecided, disagree, strongly disagree)[1]

a. The curriculum should contain abundant information about the natural resources and development possibilities of the nation.

Seven strongly agreed, 7 agreed. One expert pointed out that time limitation might restrict the amount of such information that could be included.

b. Educational programs should be scheduled so as to use available facilities as continuously as possible.

Six strongly agreed, 7 agreed, 1 was undecided.

c. Many students should drop out of each educational level to seek unskilled employment.

One agreed, 3 were undecided, 7 disagreed, 3 strongly disagreed.

d. People should be educated for the same kind of position generally held by people in their own social class.

Three were undecided, 6 disagreed, 5 strongly disagreed. One expert stated that vertical mobility is necessary for industrial development.

e. Students should make their vocational decisions early in their childhood (primary school).

Ten disagreed, 3 strongly disagreed. One expert who disagreed recommended early exposure to occupational information.

f. Only a small percentage of the population can profit from higher education.

Two agreed, 2 were undecided, 8 disagreed, 1 strongly disagreed. One expert summarized the feeling of most of the group by stating that there is still much latent ability to be tapped in Peru.

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[1] See footnotes 1 and 5, Appendix E.

g. Those students who can afford it should pay for their own higher education.

Five strongly agreed, 7 agreed, 1 was undecided, 1 disagreed. This generally positive response is of great interest since Peru has recently passed legislation making education gratuitous at all levels.

h. All educational institutions should operate a service to assist their graduates in finding suitable employment.

Five strongly agreed, 7 agreed, 2 disagreed. One expert stated that this service should have a connection with the Employment and Human Resources Service (Servicio del Empleo y Recursos Humanos--SERH). Another expert stated that for all schools to operate a service would be uneconomical. Rather, information should be made available through the 5 proposed regional offices of SERH.

i. School authorities should make information about employment opportunities in the field of manual work readily available.

Five strongly agreed, 9 agreed. One expert pointed out that (in fact) such information is not now available.

j. Educational planning should be done by technically trained personnel insulated from political changes.

Four strongly agreed, 8 agreed, 2 were undecided. One expert pointed out that this would not be realistic. Another suggested that such planners be in touch with the employment situation.

k. An educational system should allow a student of any age or previous experience to learn a marketable skill.

Seven strongly agreed, 7 agreed.

l. The school should concern itself equally with academic and vocational training.

Three strongly agreed, 7 agreed, 3 were undecided, 1 disagreed. One expert stated that more emphasis is needed on occupational training than is necessary in the United States.

m. A single training period previous to entering an occupation is sufficient for a working lifetime.

Three were undecided, 8 disagreed, 3 strongly disagreed. Most of those who disagreed felt that continual occupational training is needed.

n. Educational authorities should consult regularly with employers.

Seven strongly agreed, 6 agreed, 1 was undecided.

2. Additional comments:

Additional comments made by the educational experts were so numerous and important that they are incorporated into, and specifically referred to in the text itself.

APPENDIX G

RESULTS OF QUESTIONNAIRE (ON INDUSTRIAL PLACEMENT PROBLEMS OF SCHOOL ADMINISTRATORS) ADMINISTERED MAY 1964 TO TWELVE SECONDARY TECHNICAL SCHOOL DIRECTORS IN THE LIMA-CALLAO AREA OF PERU[1]

1. Are you satisfied with the previous preparation of your students?[2]

   Two said yes and 9 no. Four directors specifically mentioned science and math as weak areas.

2. Are you satisfied with the preparation of your instructors?

   Only 3 directors gave direct answers to this question. Of these, 2 said yes and 1 no. The normal school at Chosica (Escuela Superior Guzman y Valle, "La Cantuta"), 20 miles east of Lima in a mountain valley, was most frequently mentioned as the preparing institution for their instructors (8 times). The University of San Marcos was mentioned twice. One director stated with pride that most of his instructors came from abroad. He pointed out that La Cantuta, which "fluctuates with politics" cannot produce good instructors. Another director pointed out that La Cantuta graduates lack industrial experience. Generally, the impression was gained that La Cantuta graduates, the majority of instructors in the secondary technical schools, are not well qualified for their tasks unless they receive additional training, usually from foreign instructors (either abroad or in Peru).

3. Are you satisfied with the funds and equipment available to your school?

   All 12 directors said no. One director pointed out that most of his equipment is over 11 years old. Another director stated that his equipment is over 15 years old. One stated that he has equipment for only one-third of his students. A private school director pointed out that his school receives no state funds for any purpose. Generally, the impression was gained that, although the state pays the salaries of teachers and administrators (in public institutions), virtually no funds are available for purchase of materials or the purchase and maintenance of equipment.

4. Does your school operate an employment service to assist students in finding suitable employment?

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[1] Because the Centro Técnico Franco-Peruano (see Appendix B) has special (non-secondary) features, the responses of its director are not included here.

[2] See footnotes 1 and 3, Appendix E.

Seven said yes and 4 no. One director said that he "personally" places graduates. Another stated that he maintains contact with the small television and electrical shops. One director claimed to have a man employed full-time circulating among industrial firms. However, only one director could name the firms where his graduates had been placed. Although the response to this question was generally positive, it seems that most directors had in mind an "informal" placement service. The impression was gained that very few (if any) of these schools have a systematic placement service which serves all students.

5. Do industrial employers ever contact you seeking employees for their firms?

   Nine said yes and 3 no. However, only 2 directors could name the contacting firms. Two directors mentioned that "small local shopkeepers" had contacted them. The impression was gained that, although the directors may be contacted by small employers, the total demand for graduates is small (see Appendix E, Item 9).

6. Do you ever contact industrial employers about job opportunities for your students?

   Ten said yes. However, only two employers were specific about the firms they had contacted. One director claimed to have made a survey of Callao. Two directors said that they consult "informally" with employers. Two directors specified that they maintain contact with "small local shopkeepers." The impression was gained that most directors do not maintain contact with a sufficiently large employment market.

7. Does your school encourage students to enter industry after leaving school?

   All 12 directors said yes. One director pointed out that there is contact with industry by means of the apprenticeship required of students (in most of the schools) during their last year of study. However, as pointed out in the text, only about 40% eventually find jobs in industry.

8. How many of your students are interested in a position in industry after leaving school?

   Since only one of the directors could be exact in response to this question, the responses "all," "few," "many," and "none" were suggested. On this basis 10 directors said "many" (one of them specifying 70%). One director mentioned that his school places last-year students in industry for apprenticeship training (where they become interested in continued employment). Still another mentioned that a certain percentage seek to continue their studies. Another stated an intention to make a survey to determine this information. Generally, although no systematic methods of determination were used, the directors felt that the majority of their students were serious about industrial employment.

9. What is the ideal preparation for industrial employment?

One director indicated a preference for detailed theoretical pre-employment training. Eight chose an apprenticeship work-study program as the ideal system. It is interesting to compare this response with that of the employers (see Appendix E, Item 11).

10. About what percentage of your students do the following after leaving school: get a white-collar position, get a blue-collar position, go on for further schooling, become unemployed, other (please specify)?

The response to this question varied to such an extent from school to school that it seemed evident that this type of information was not customarily collected by the school authorities. None of the directors indicated that their figures were based on anything other than offhand estimates. No follow-up studies of any kind were referred to. The range of estimates was as follows: white-collar position, from 5 to 60%; blue-collar position, from 40 to 80%; further schooling, from 5 to 30%; unemployed, from 5 to 20%; other (Armed Forces), from 4 to 20%.

11. What is your reaction to the following statements? (Strongly agree, agree, undecided, disagree, strongly disagree)

a. The curriculum should contain abundant information about the natural resources and development possibilities of the nation.

One strongly agreed, 10 agreed.

b. Educational programs should be scheduled so as to use available facilities as continuously as possible.

Three strongly agreed, 9 agreed.

c. Many students should drop out of each educational level to seek unskilled employment.

d. People should be educated for the same kind of position generally held by people in their own social class.

One agreed, 1 was undecided, 9 disagreed.

e. Students should make their vocational decisions early in their childhood (primary school).

Four agreed, 2 were undecided, 5 disagreed.

f. Only a small percentage of the population can profit from higher education.

Four agreed, 1 was undecided, 5 disagreed. One director stated that if industry were more developed a larger percentage of students could profit from technical education.

g. Those students who can afford it should pay for their own higher education.

One strongly agreed, 6 agreed, 1 disagreed. This positive response (which agrees with that of the educational experts, see Appendix F, Item g) is interesting in view of the fact that Peru recently passed legislation making education at all levels gratuitous. This fact may have reduced the number of school directors who were willing to respond (8 out of 12). One director stated that Peru needs more schools because some students must attend private schools because there is no room for them in public schools. Thus they are forced to pay for their own education.

h. All educational institutions should operate a service to assist their graduates in finding suitable employment.

Four strongly agreed, 6 agreed.

i. School authorities should make information about employment opportunities in the field of manual work readily available.

Six strongly agreed, 5 agreed.

j. Educational planning should be done by technically trained personnel insulated from political changes.

Six strongly agreed, 6 agreed.

k. An educational system should allow a student of any age or previous experience to learn a marketable skill.

l. The school should concern itself equally with academic and vocational training.

Three strongly agreed, 8 agreed.

m. A single training period previous to entering an occupation is sufficient for a working lifetime.

Eight disagreed, 2 strongly disagreed.

n. Educational authorities should consult regularly with employers.

Seven strongly agreed, 3 agreed.

APPENDIX H

SOURCES OF INFORMATION--PERSONS[1]

Name	Title[2]	Institution[3]
Allen, William (Mr.)	Manager	Anderson, Clayton & Co.
Alvarez C., Gaston[4] (Ing.)	Director	Escuela Técnica de Electrónica
Anderson, Theodore (Dr.)	Head, Tri-Partite Group of Economic Advisors	National Planning Institute
Barclay, Percy (Mr.)	Manager, Sugar and Paper Division	W. R. Grace & Company
Baum, John A. (Dr.)	Advisor to the Ministry of Education	Teachers College, Columbia University
Bayly, Jaime (Mr.)	Manager	Lima Rubber Company
Berkmeyer, Luis (Mr.)	Manager	Leche Gloria, S.A.
Brau, Enrique (Mr.)	Executive, Accounting Division	Empresas Eléctricas Asociadas
Brunstetter, Max R. (Dr.)	Head, Advisory Team	Teachers College, Columbia University
Bustamante R., Jose Luis (Dr.)	Director	International Labor Office
Caldwell, Gaylon (Mr.)	Cultural Attaché	U.S. Embassy

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[1] To save space this list includes only the names of persons actually interviewed.

[2] These titles are the titles of the person at the time of the interview.

[3] Unless otherwise indicated all institutions (or branch offices) can be assumed to be located in Lima.

[4] In Spanish names, the next to last name is generally the name by which the person is addressed. For example, Ing. (Engineer) Gaston Alvarez Castillo would be addressed as Ing. Alvarez.

Name	Title	Institution
Chiapetta, Michael (Dr.)	Latin American Division	U.S. Agency for International Development (Washington, D.C.)
Clark, Harold F.	Professor of Economics and Education	Teachers College, Columbia University
Coleman, Alan B. (Dr.)	Director	Escuela de Administración de Negocios para Graduados (ESAN)
Cueto F., Carlos (Dr.)	Director	Biblioteca Nacional
Del Pozo A., Andres N. (Prof.)	Director	Instituto Nacional de Educación Industrial No. 1, "Estados Unidos"
Dermer, Jake (Mr.)	Executive	Empresa Pesquera Ilo, S.A.
Deza V., Jorge (Mr.)	Director of Technical Education and Artisan Development	Ministry of Education
Dias H., Daniel (Prof.)	Secretary, Faculty of Education	Universidad Católica
Dibos D., Eduardo (Mr.)	President	Goodyear del Perú
D'Onofrio, Luis (Mr.)	Manager	P. y A. D'Onofrio, S.A.
Dykstra, Gerald (Prof.)	Acting Chief of Party	Teachers College, Columbia University
East, Enrique (Mr.)	Vice President	Marcona Mining Company
Fossoy, H. Marcel (Dr.)	UNESCO Expert on Educational Planning	National Planning Institute
Fraenkel, Peter (Mr.)	Program Associate	Ford Foundation
Frost (Mr.)	Assistant Manager	The Peruvian Corporation, Ltd.

Name	Title	Institution
Galecio M., Benjamin (Mr.)	Director	Escuelas Técnicas "Gamor"
Gettys, Paul E. (Dr.)	Director	Colegio Franklin Delano Roosevelt
Giesseke, Albert (Dr.)	Civil Advisor	U.S. Embassy
Godin, Andres (O.M.I.)	Representative	Colegio Industrial "Nuestra Señora de la Paz"
Greco, George J. (Mr.)	Chief of Division, Industry and Manpower	U.S. Agency for International Development
Hart, Estelita (Mrs.)	Documents Control	Organization of American States (Washington, D.C.)
Hartzog, David (Dr.)	Project Officer, Training Division	United Nations Special Fund (New York)
Harwood, Wilson (Mr.)	Chief of Party	Stanford Research Institute
Hemingway, Robert (Mr.)	UNESCO Advisor to the Ministry of Education on Technical Education	School of Technology
Indocochea, Luisa (Miss)	Librarian	Universidad Mayor de San Marcos
Indocochea, Matilde (Miss)	Assistant to Teachers College Team	Ministry of Education
Insua, Alberto (Dr.)	Director, Servicio del Empleo y Recursos Humanos (SERH)	Ministry of Labor
Jackson, Charles (Mr.)	Resident Advisor	Stanford Research Institute (Cuzco)
King, Norman E. (Dr.)	Director, Industrial Relations	Cerro de Pasco Corporation

Name	Title	Institution
Kursell, C. A. (Mr.)	Business Manager	Southern Peru Copper Corporation
Larsson, Allan (Mr.)	Manager	Atlas Copco Peruano, S.A.
Laurie, Alex (Mr.)	Personnel Manager	Backus & Johnson's Brewery del Perú, S.A.
Linsay, Gerard Ian (Mr.)	Chief of Training	International Petroleum Company
Loayza G., Rafael (Dr.)	Director	Politécnico Nacional "José Pardo"
Lopez J., Manuel (Ing.)	Director	Instituto Nacional de Educación Industrial No. 24, "Ricardo Palma"
Malpica F., Carlos (Dr.)	Educational Programmer	National Planning Institute
Martin, Robert E. (Mr.)	Educational Advisor to the Minister of Education	U.S. Agency for International Development
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